

# DENON

Hi-Fi Component Tuner Amplifier

## SERVICE MANUAL MODEL DRA-750

*For European Model*

SOLID STATE  
TUNER AMPLIFIER



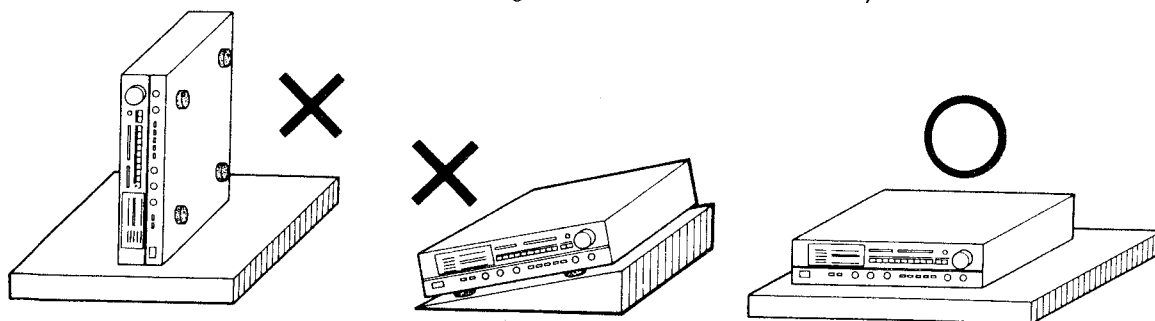
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## NIPPON COLUMBIA CO., LTD.

## PRECAUTIONS FOR INSTALLATION

DRA-750 uses a newly developed heat emitting unit by employing heat pipes. Since the heat pipes contain a coolant, the DRA-750 must be set level or the desired heat emitting effect cannot be achieved. Always install this unit horizontally.



## ADVICE FOR USE

- Do not place the set in direct sunlight, in hot areas such as near heating equipment, with high humidity or dust levels. This may cause damage to the unit.
- Check that all parts are connected correctly before turning on the power source.
- When user is absent for long periods, be sure to remove plug from wall socket.
- Do not use insecticide, benzene or thinner near the unit, or the cabinet color will fade. Avoid using polish: use a soft cloth (e.g. silicon cloth).
- Although the unit is designed to support weight, it is recommended that the user does not place anything too heavy on it. Consider air circulation before placing anything on the unit. If you place any equipment likely to induce hum, make sure there is enough space to between each piece of equipment prevent such hum.

## SPECIFICATIONS

### AMPLIFIER SECTION

<b>Continuous Power Output:</b>	70 W + 70 W at 8 ohm, 85 W / 8 ohm DIN
<b>Power Bandwidth (IHF):</b>	5 Hz ~ 40 kHz (THD 0.05% both ch. driven at 8 ohm)
<b>Total Harmonic Distortion (20 Hz to 20 kHz):</b>	-3 dB power into 8 ohms 0.008%
<b>Intermodulation Distortion (60 Hz : 7 kHz, 4 : 1 SMPTE):</b>	rated power into 8 ohms 0.005%
<b>Damping Factor:</b>	More than 80 (at 1 kHz, 8 ohms)

### PREAMPLIFIER SECTION

<b>Frequency Response:</b>	PHONO RIAA Standard Curve (Recording Output) (MM) 20 Hz ~ 20 kHz $\pm 0.3$ dB (MC) 50 Hz ~ 20 kHz $\pm 0.5$ dB TAPE, VIDEO/AUX, DAD/AUX 20 Hz ~ 50 kHz $\pm 1.5$ dB
<b>Input Sensitivity and Impedance:</b>	PHONO MM 2.5 mV 47 k ohm MC 0.25 mV 100 ohm TAPE, VIDEO/AUX, DAD/AUX 150 mV 33 k ohm
<b>Maximum Input Level (at 1 kHz):</b>	PHONO MM 200 mV MC 20 mV
<b>Signal to Noise Ratio (IHF-A):</b>	PHONO MM @ 5.0 mV input 90 dB MC @ 0.5 mV input 74 dB TAPE, VIDEO/AUX, DAD/AUX @ 150 mV input 95 dB
<b>Tone Control Range:</b>	BASS at 100 Hz $\pm 8$ dB TREBLE at 10 kHz $\pm 8$ dB
<b>Loudness Control Effect:</b>	VARIABLE LOUDNESS "10" POSITION +10 dB / +5 dB
<b>Subsonic Filter Effect:</b>	15 Hz / -6 dB oct.

### TUNER SECTION

<b>[FM]</b>	
<b>Receiving Range:</b>	87.5 ~ 108 MHz
<b>Usable Sensitivity:</b>	0.9 $\mu$ V (10.3 dBf)
<b>50 dB Quieting Sensitivity:</b>	MONO 2.0 $\mu$ V (17.2 dBf) STEREO 23 $\mu$ V (38.5 dBf)
<b>Signal to Noise Ratio:</b>	MONO 83 dB STEREO 81 dB
<b>Total Harmonic Distortion 1 kHz:</b>	MONO 0.1% STEREO 0.3%
<b>Selectivity:</b>	70 dB ( $\pm 400$ kHz)
<b>Capture Ratio:</b>	1.5 dB
<b>Image Rejection:</b>	75 dB
<b>AM Suppression:</b>	60 dB
<b>Frequency Response:</b>	30 Hz ~ 15 kHz $+0.2$ $-1.5$ dB
<b>Stereo Separation:</b>	50 dB (1 kHz)
<b>IF Rejection:</b>	85 dB

### [AM]

<b>Receiving Range:</b>	522 ~ 1611 kHz
<b>Usable Sensitivity:</b>	18 $\mu$ V
<b>Signal to Noise Ratio:</b>	55 dB

### GENERAL

<b>Power Supply:</b>	AC 220 V, 50 Hz
<b>Power Consumption:</b>	150 W
<b>Dimensions:</b>	434 mm (W) x 112 mm (H) x 400 mm (D) (17-3/32" x 4-13/32" x 15-3/4")
<b>Weight:</b>	9.0 kg (19 lbs 14 oz)

Design and specifications are subject to change without prior notice.

NOTE: This Service Manual is prepared base on Gold Version.

# NAME AND FUNCTION OF PARTS FRONT PANEL

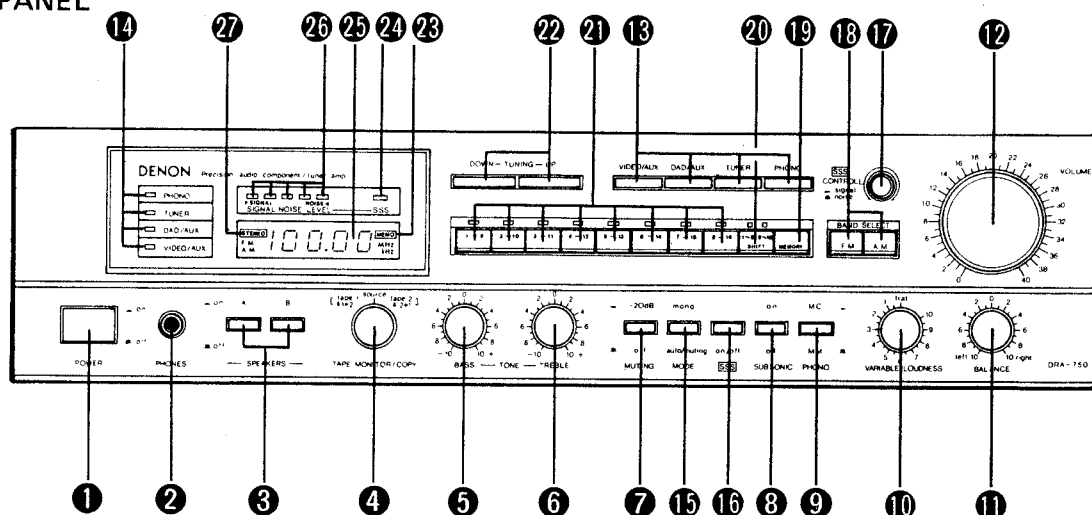


Fig. 1

- |   |  |
|---|--|
| ① POWER (Power Switch)  | ⑬ SSS ON/OFF (See Page 12 for Details Regarding the SSS) |
| ② PHONES (Head Phone Jack)  | ⑭ SSS CONTROLLER (SSS Control Knob)                      |
| ③ SPEAKERS (Speaker Select Switch)  | ⑮ BAND SELECT (Band Selector Buttons)                    |
| ④ TAPE MONITOR/COPY   | ● AM, ● FM   |
| ⑤ BASS (Bass Control)   | ⑰ MEMORY (Memory Button)                                 |
| ⑥ TREBLE (Treble Control)   | ⑱ SHIFT (Shift Button)                                   |
| ⑦ MUTING (Muting Switch)  | ⑲ PRESET CHANNEL 1 ~ 16 (Station Presetting Buttons)     |
| ⑧ SUBSONIC FILTER (Subsonic Filter Switch)                                    | ⑳ TUNING (Tuning Buttons)                                |
| ⑨ PHONO (Cartridge Select Switch) $\blacktriangle$ : MC $\blacktriangle$ : MM | UP, DOWN   |
| ⑩ VARIABLE LOUDNESS   | ㉑ MEMORY INDICATOR                                       |
| ⑪ BALANCE (Balance Control)   | ㉒ SSS (SSS Indicator)                                    |
| ⑫ VOLUME (Volume Control)   | ㉓ DIGITAL FREQUENCY INDICATOR                            |
| ⑬ FUNCTION (Input Select Switch)  | ㉔ SIGNAL/NOISE LEVEL (Signal/Noise Level Indicator)      |
| ● PHONO, ● TUNER, ● DAD/AUX, ● VIDEO/AUX                                      | ㉕ STEREO (Stereo Indicator)                              |
| ⑭ FUNCTION INDICATOR  |  |
| ⑮ MODE (FM Mode, Muting and Tuning Mode Switch)                               |  |
| $\blacktriangle$ : auto/muting, $\blacktriangle$ : mono                       |  |

## BACK PANEL

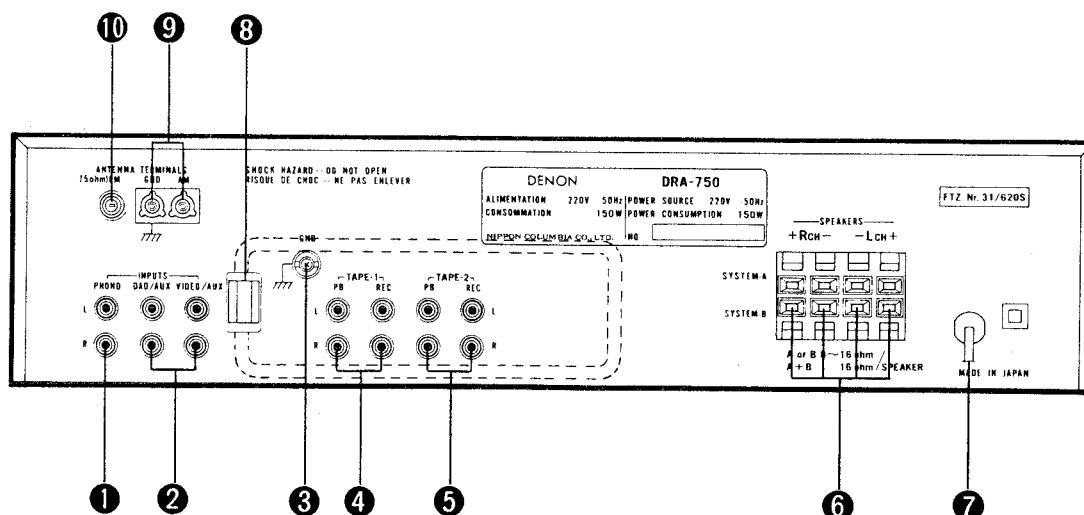


Fig. 2

- |   |                                       |
|---|---------------------------------------|
| ① PHONO (Phono Input Terminals)                   | ⑦ AC Cord (Power Cord)                |
| ② DAD/AUX, VIDEO/AUX (Input Terminals)            | ⑧ AM LOOP ANT (AM Loop Antenna)       |
| ③ GND (Grounding Terminal)                        | ⑨ AM ANT (AM Antenna Terminal)        |
| ④ ⑤ TAPE-1, -2 (Playback and Recording Terminals) | ⑩ FM ANT 75 ohm (FM Antenna Terminal) |
| ⑥ SPEAKERS (Speaker Terminals)                    |                                       |

## CONNECTIONS

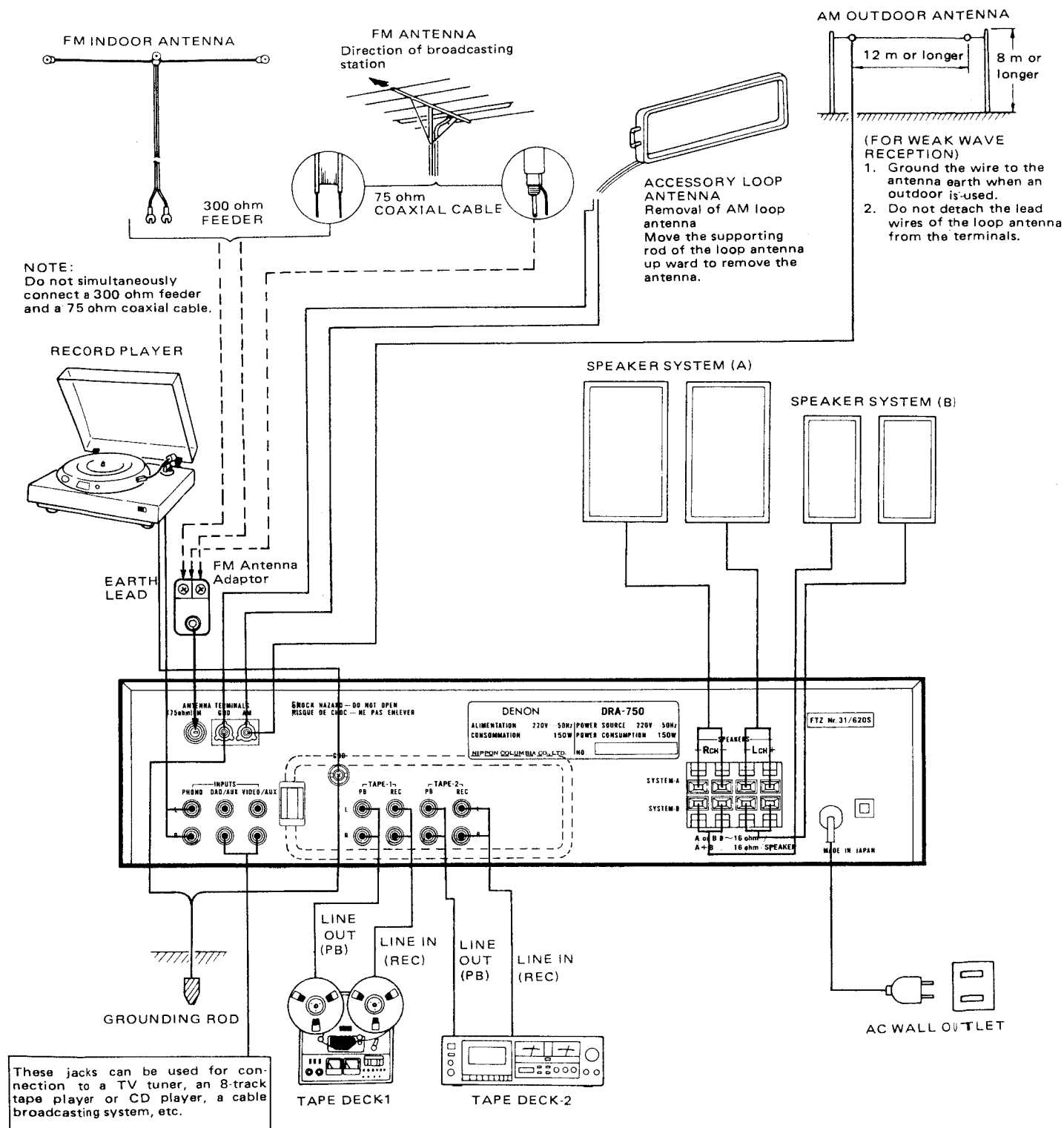


Fig. 3

- Do not plug the power source cord into an AC outlet until all the connections are completed.
- Connect the right (R) channel plug to the right (R) channel jack, and the left channel plug to the left channel jack.
- Insert the plugs firmly into the corresponding jacks. If a connection is incomplete, noise may be generated.
- Plug the power source cord for audio equipment into the AC OUTLET terminal. Do not use this terminal for other electric appliances such as hair dryer. (NOT INCLUDED IN SYSTEM FOR EUROPEAN USE)
- Do not bundle the pin plug cords with the power source cord and do not place the pin plug cords near the power transformer, or humming and other noise may be generated.
- Always connect the pin plug cord to the input terminal "PHONO" because this terminal is highly sensitive. If this terminal is not connected, induction hum may be generated.

## ANTENNA INSTALLATION

### ● T TYPE FM INDOOR ANTENNA

The T type indoor antenna (300 ohm) can be used inside wooden houses when FM stations are local and strong signals can be received. While receiving an FM program, extend the horizontal part of the antenna. Orient the T-shaped part for optimal reception and mount the antenna on the wall or ceiling.

\* In general, FM indoor antennas might not consistently assure stable reception, due to environmental changes. Use an FM indoor antenna temporarily until an outdoor antenna is installed.

### ● FM OUTDOOR ANTENNA CONNECTION (Fig. 4)

75 ohm coaxial cable (3C-2V, 5C-2V) is preferable to obtain better performance of the tuner.

\* Contact your local dealer for details on selection and installation of the FM outdoor antenna.

\* When a 300 ohm FM antenna is connected by a 75 ohm coaxial cable, a matching transformer is required.

### ● AM ANTENNA CONNECTION (Fig. 5)

Since the model is provided with a high performance AM loop antenna on the back panel, this accessory antenna can effectively be used for optimal reception in places where broadcasting stations are located nearby and relatively strong signals are received with low noise.

Orient the loop antenna horizontally to obtain optimal reception.

In places where strong, clear signals are not received due to particular location and/or environmental conditions, connect an insulated wire to the AM antenna terminals and attach it to the wall. In places where broadcasting stations are located too far away and only weak signals are received, or where signals are blocked by obstacles, install an AM outdoor antenna.

\* Even if an AM outdoor antenna is installed, do not detach the AM loop antenna.

## GROUNDING

If there is much noise during reception, it is recommended that a grounding wire be used.

Connect a thick insulated wire to the "GND" terminal, and wind the unconnected bare end around a metal water pipe, a grounding rod, or a grounded copper plate.

\* Never connect grounding the wire to a gas pipe. This could cause fire or explosion.

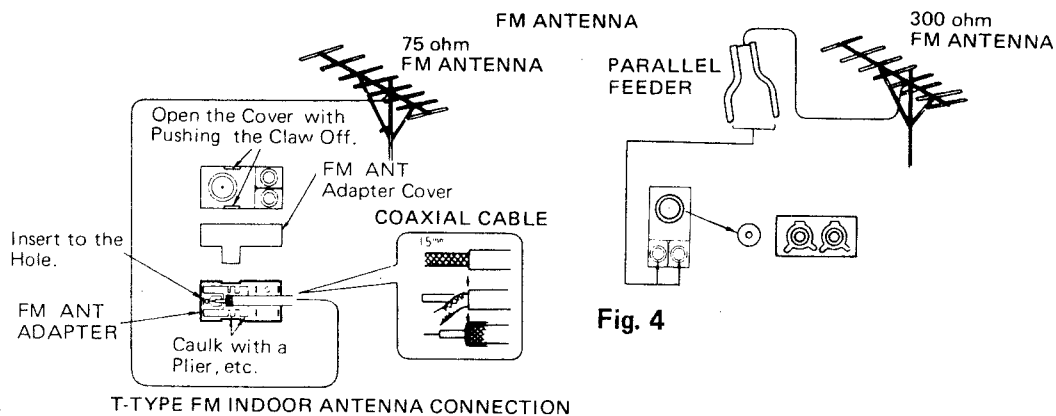


Fig. 4

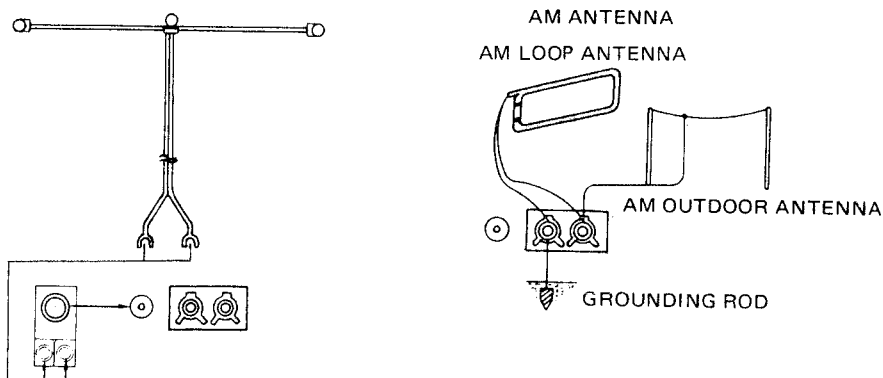


Fig. 5

Note: Two FM antennas should not be connected simultaneously. Even if an external AM antenna is used, the LOOP antenna connects with an AM loop antenna terminals on the back panel. Be sure the lead terminal does not touch the metal part of back panel.

## BLOCK DIAGRAM

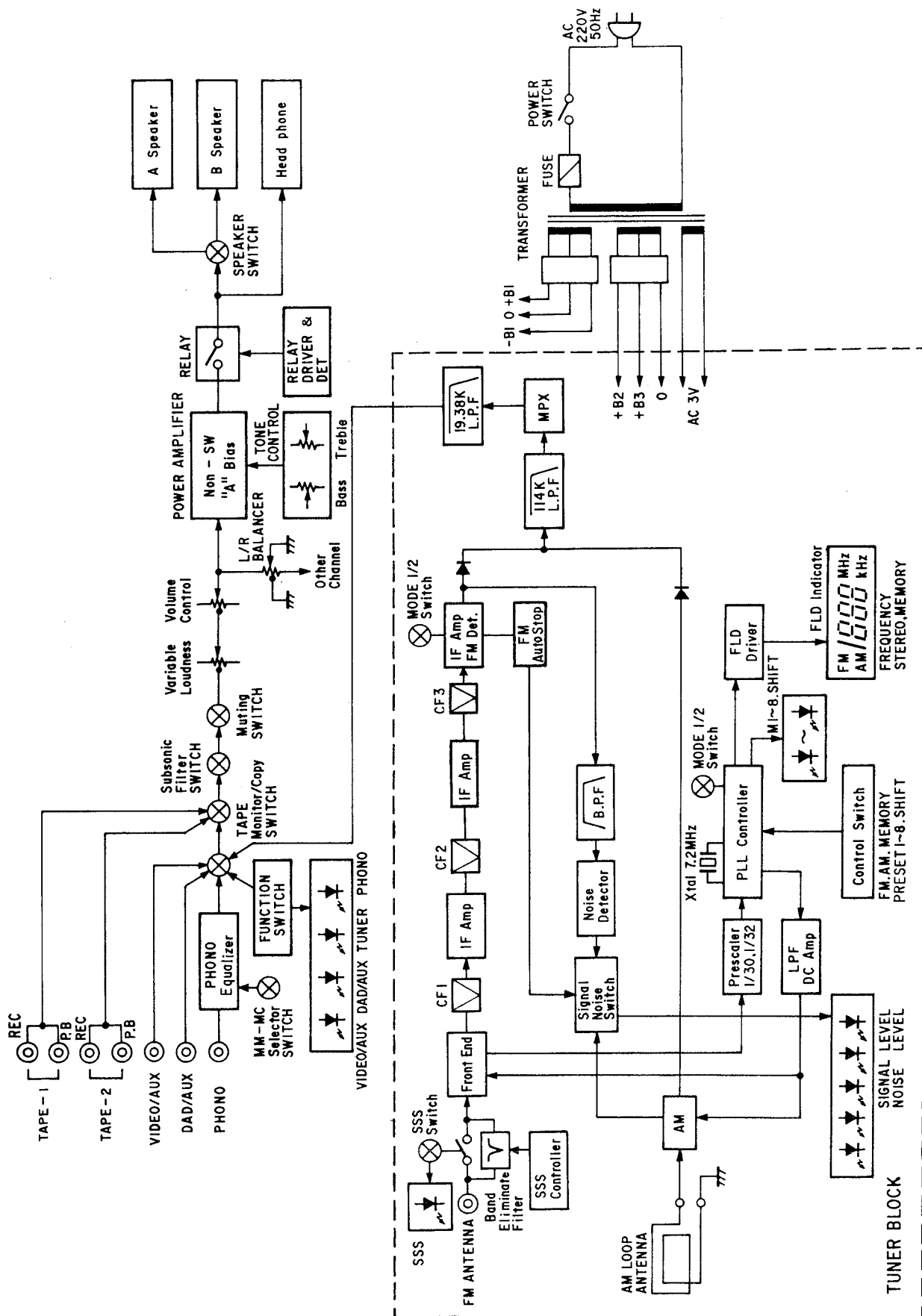


Fig. 6

## METHOD OF ADJUSTMENTS

When making adjustments, be sure the power supply is at the rated voltage and the room air is in normal condition with respect to temperature and humidity.

### • AMPLIFIER SECTION

#### 1. IDLING CURRENT (Fig. 7)

(1) Set controls as follows.

POWER Switch → off (I)

VOLUME Control → 0 (min.)

SPEAKERS → off (I)

Temperature → 15°C ~ 30°C

VR3 and VR4 of the ETC9028-1 (POWER PRE Unit) → Center

Power supply → AC 220 V, 50 Hz.

(2) Connect Digital Voltmeter to the test points 38 (+), 39 (-) and 35 (+), 36 (-) of the ETC9028-1.

(3) Turn the Power Switch on and rotate VR3 clockwise so that the Digital Voltmeter reads  $1\text{mV} \pm 0.2\text{mV DC}$  at the test point 38,39. Follow the same procedure to VR4 for test point 35,36.

(4) Warm up one minute, then readjust VR3 and VR4 as in step (3) so that the Digital Voltmeter reads  $1.5\text{mV} \pm 0.3\text{mV DC}$ .

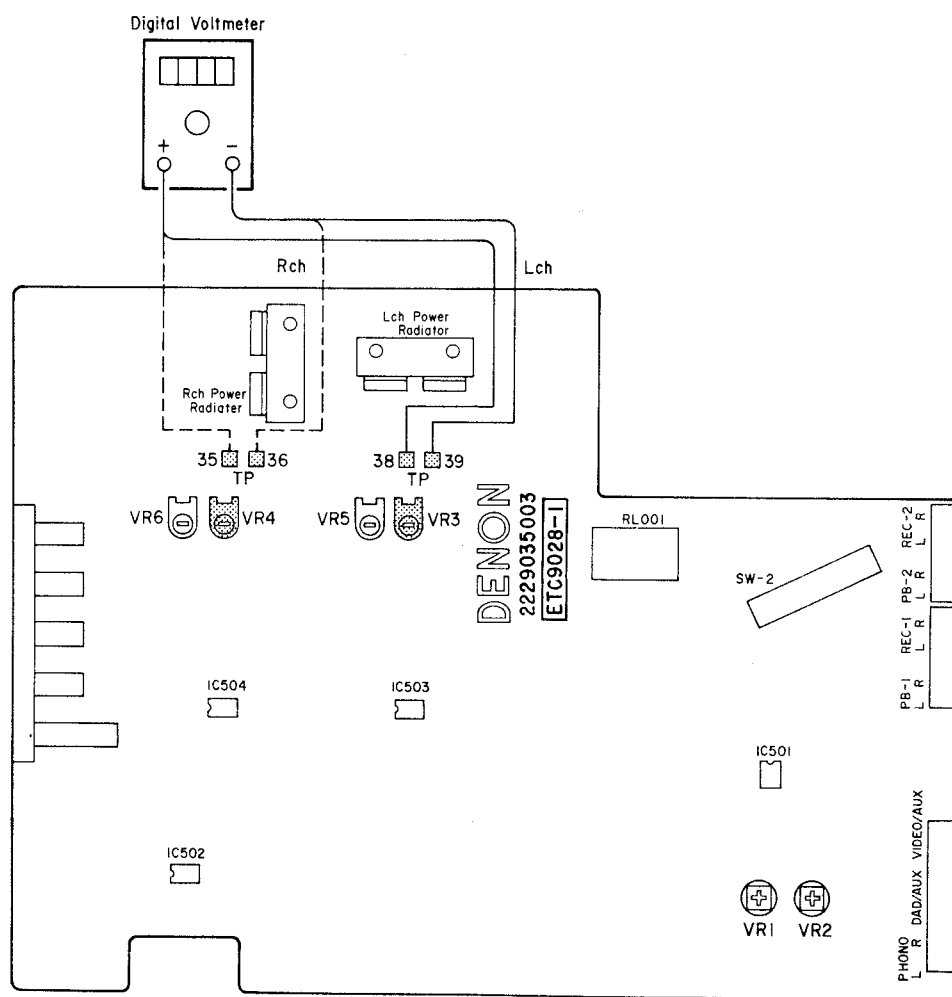


Fig. 7

## • POWER AMP SECTION

### 2. DISTORTION (Fig. 8)

- (1) Connect 8 ohm resistors across the Speaker Terminals.
- (2) Turn the Power Switch on.
- (3) Set the Volume Control to "16".
- (4) Apply 20 kHz sine wave to DAD/AUX input terminal and adjust output level of the Oscillator so that 17Vrms are delivered across the 8 ohm resistor. (Apply both L and R-ch)
- (5) Adjust VR5 (L-ch) and VR6 (R-ch) for minimum distortion.

## • EQ. AMP SECTION

### 3. NEUTRAL POINT (Fig. 8)

- (1) Set controls as follows.
 

TAPE MONITOR Switch	— source
INPUT SELECTOR Switch	— PHONO (PHONO INPUT . . . . Short)
VOLUME Control	— 0 (min.)
- (2) Connect Digital Voltmeter to REC-1 and REC-2 output Terminal.
- (3) Turn the Power Switch on.
- (4) Warm up 5 to 10 minutes, then adjust VR1 so that the DC Voltmeter reads  $0 \pm 1\text{mV}$  at REC-1. Follow the same procedure to VR2 for REC-2.

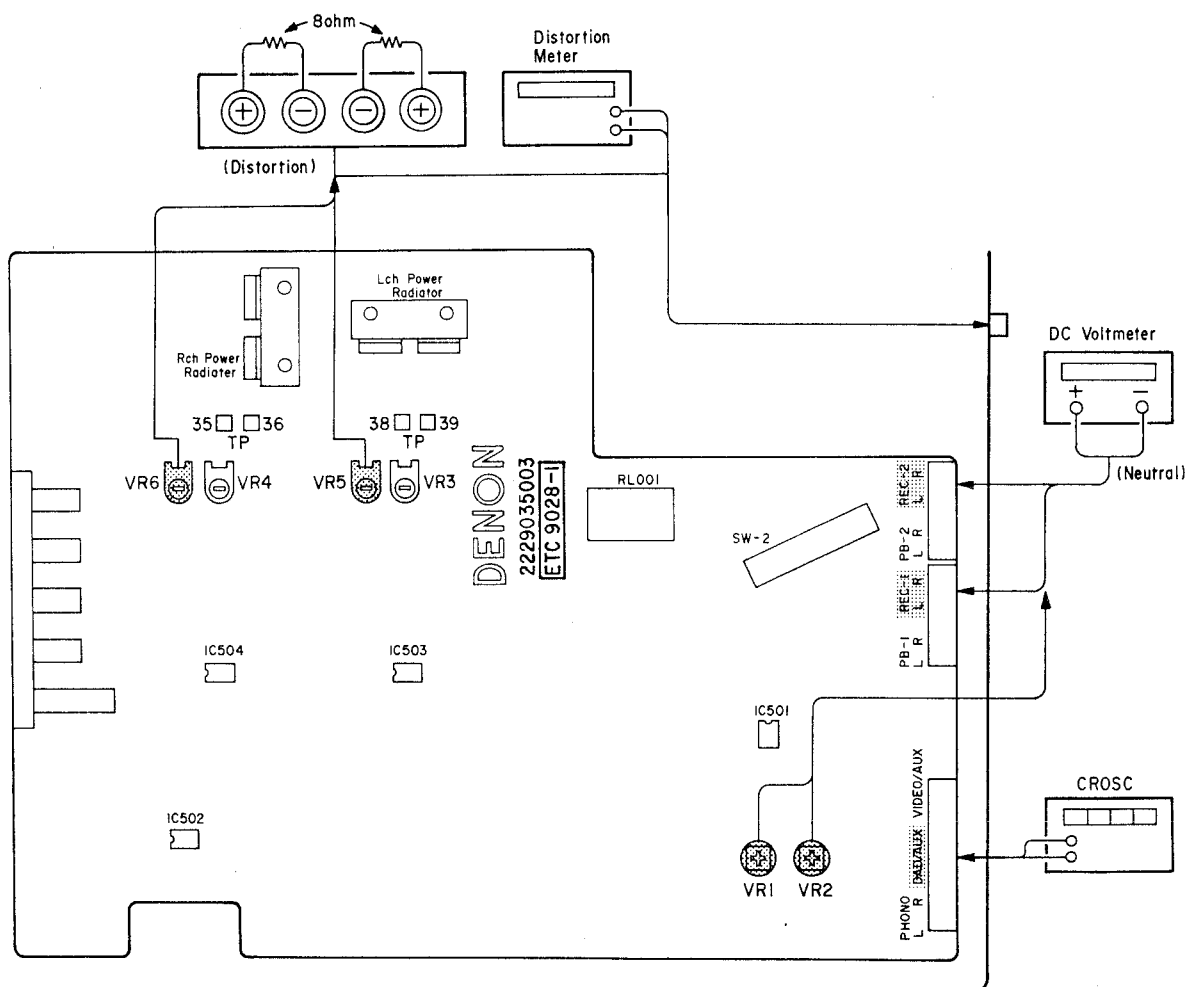


Fig. 8

• Tuner Section

ADJUSTMENT OF RF TRAP UNIT (ETC0658J) ( [SSS] on, MODE — mono) Table 1

Adjustment Item	Tuning	Input Side		Output Side		Adjustment Point	Adjustment Value
		Measuring Instrument	Frequency	Input Level	Modulation	Connection Point	
1 88 MHz Tracking Check	88.00 MHz	FM SSG	88.0 MHz	Variable depending on output waveform attenuation	Mono 1 kHz, 100%	Antenna Terminal	3 V ± 10 mV at the time of adjustment to the max. point of output waveform attenuation using the SSS controller
2 108 MHz Tracking Check	108.00 MHz	FM SSG	108.0 MHz	Variable depending on output waveform attenuation	Mono 1 kHz, 100%	Antenna Terminal	20 V ± 100 mV at the time of adjustment to the max. point of output waveform attenuation using the SSS controller
3				If NG in items 1 and 2, advance to items 4 to 6			
4 108 MHz Tracking	108.00 MHz	FM SSG	108.0 MHz	Variable depending on output waveform attenuation	Mono 1 kHz, 100%	Antenna Terminal	Output waveform attenuation is max. at 20 V ± 50 mV
5 88 MHz Tracking	88.00 MHz	FM SSG	88.0 MHz	Variable depending on output waveform attenuation	Mono 1 kHz, 100%	Antenna Terminal	Output waveform attenuation is max. at 3 V ± 5 mV
6				Repeat the adjustment in items 4 and 5 so that the waveform attenuation is maximum at the rated voltage			
7 Adjustment of Attenuation	98.00 MHz	FM SSG	98.0 MHz	Variable depending on output waveform attenuation	Mono 1 kHz, 100%	Antenna Terminal	Adjust to max. attenuation after adjustment to the max. point of output waveform attenuation using the SSS controller



Fig. 9

Table 2

Adjustment Item	Tuning	Input Side			Output Side			Remarks
		Measuring Instrument	Frequency	Input Level	Modulation	Connection Point	Measuring Instrument	
1 76 kHz	98.00 MHz	FM SSG	98.0 MHz	60 dBμ	Mono 1 kHz, 100%	Antenna Terminal	Frequency Counter	Adjustment Value: 76 kHz ± 50 Hz
2 Center Adjustment	98.00 MHz	FM SSG	98.0 MHz	60 dBμ	Mono 1 kHz, 100%	Antenna Terminal	Tuning Meter	Adjustment Value: Tuning Meter Center
3 Mono Distortion	98.00 MHz	FM SSG	98.0 MHz	60 dBμ	Mono 1 kHz, 100%	Antenna Terminal	Distortion Meter	Adjustment Value: Min. Distortion
4 Stereo Distortion	98.00 MHz	FM SSG	98.0 MHz	60 dBμ	Stereo (L) 1 kHz Main Pilot 10%	Antenna Terminal	Distortion Meter	Adjustment Value: Min. Distortion
5 Tuning Center Distortion Adjustment				Repeat items 2 to 4 so that the tuning meter may indicate its center value, and the distortion is minimum at tuning time				
6 Noise Indicator LED ON Level	98.00 MHz	FM SSG	98.0 MHz	-3 dBμ	Mono 1 kHz, 100%	Antenna Terminal		Adjustment Value: 5th Noise LED ON
7 Signal Indicator LED ON Level	98.00 MHz	FM SSG	98.0 MHz	55 dBμ	Mono 1 kHz, 100%	Antenna Terminal		Adjustment Value: 5th Signal LED ON
8 Separation	98.00 MHz	FM SSG	98.0 MHz	60 dBμ	Stereo (L) 1 kHz Main Pilot 10%	Antenna Terminal	Voltmeter	Adjustment Value: Max. Separation (balance of directivity)

AM

1 IF Adjustment	No. broadcasting Frequency	AM IF Sweep	No-IF Waveform Distortion Level			AM Antenna Terminal	Monitor Scope	Adjustment Value: Flat at Max. IF Waveform
2 522 kHz Tuning Voltage	522 kHz						Digital Voltmeter	Adjustment Value: 1.2 V ± 20 mV
3 1611 kHz Tuning Voltage	1611 kHz						Digital Voltmeter	Adjustment Value: 8 V ± 100 mV
4			Repeat items 2 and 3 to obtain rated tuning voltage					
5 603 kHz Tracking	603 kHz	AM SSG	Non-AGC Level	400 Hz, 30%		Loop Antenna	Voltmeter	Adjustment Value: Max. Output not over to work AGC
6 1404 kHz Tracking	1404 kHz	AM SSG	Non-AGC Level	400 Hz, 30%		Loop Antenna	Voltmeter	Adjustment Value: Max. Output not over to work AGC
7			Repeat items 5 and 6 to adjust the tracking					
8 Signal Indicator LED ON Level	999 kHz	AM SSG		400 Hz, 30%		Loop Antenna		Adjustment Value: 1st Signal LED ON 55 ± 10 dBμ/m

CONNECTION DIAGRAM OF MEASURING INSTRUMENTS

• FM

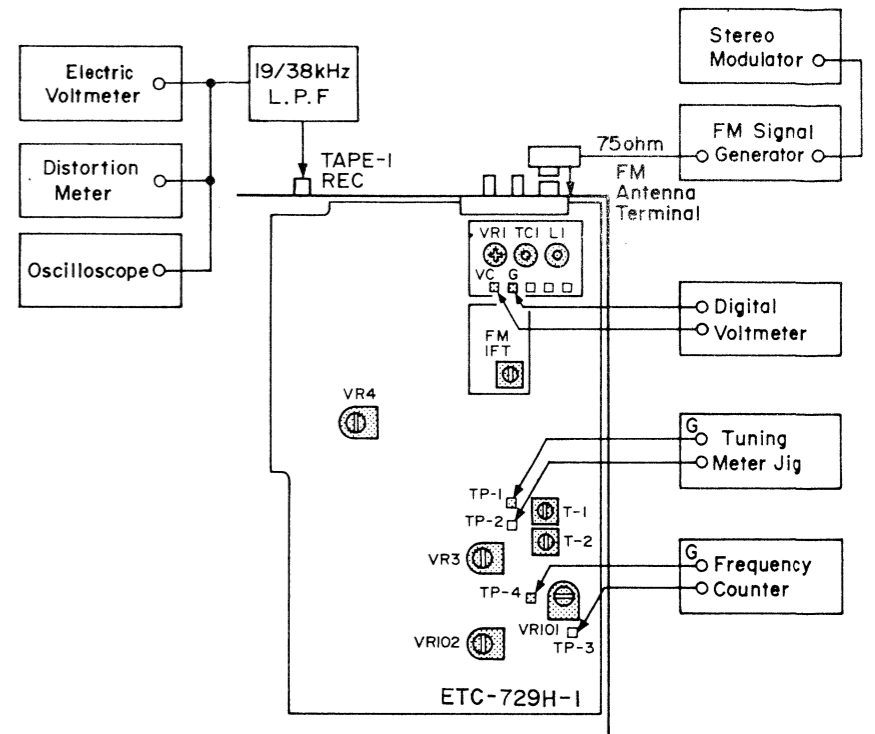


Fig. 10

• AM

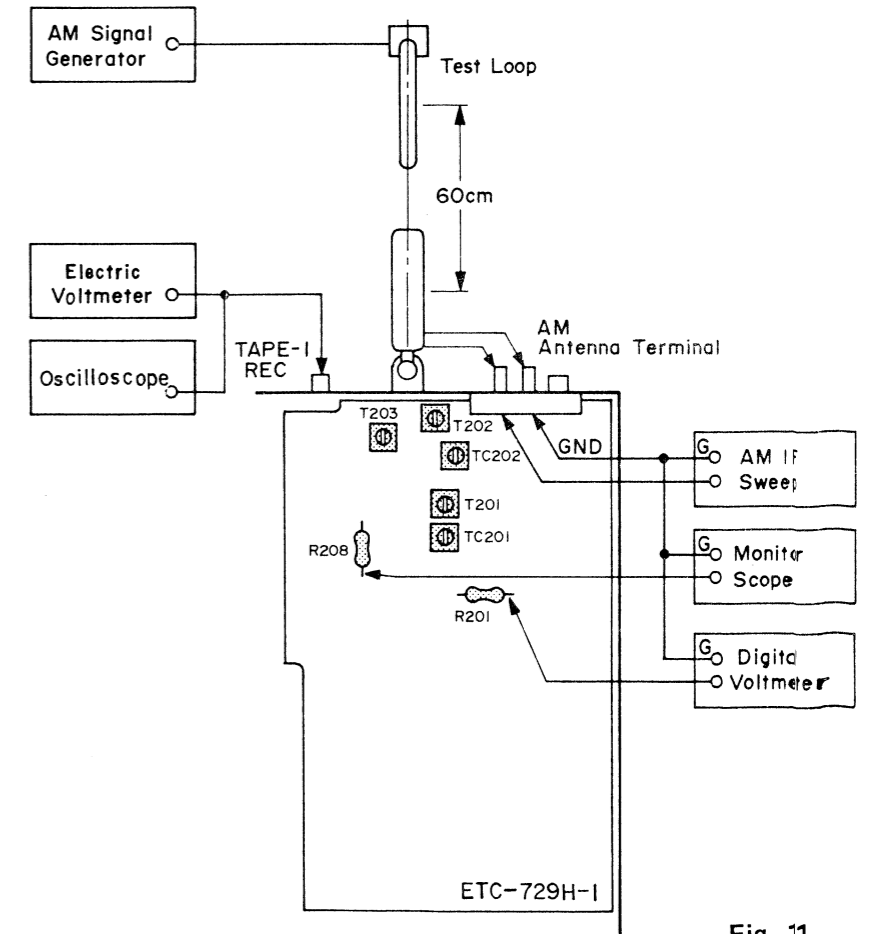
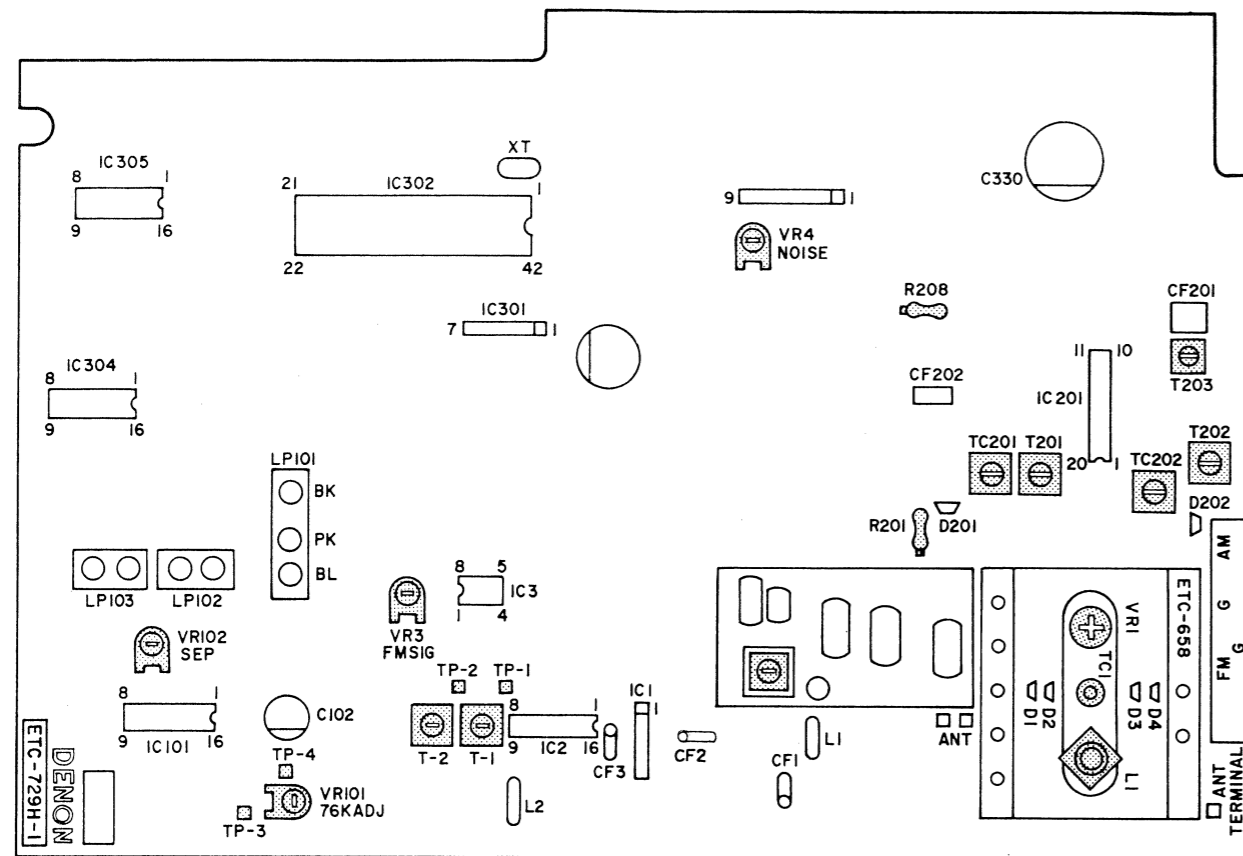


Fig. 11

### ROUGH DIAGRAM OF ADJUSTMENT POINT ETC0729H Tuner Unit (Component Side)

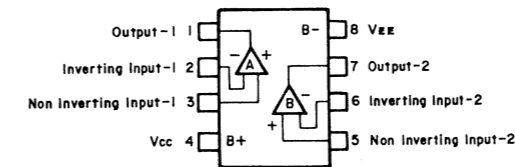
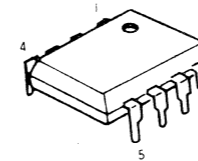


**Fig. 12**

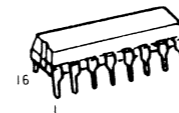
## SEMICONDUCTORS

- IC's

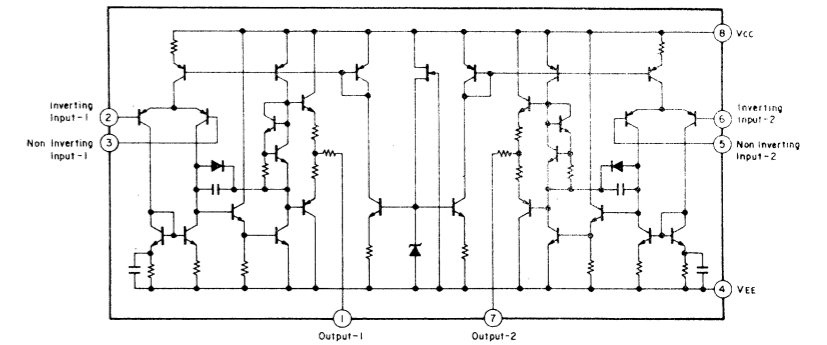
NJM4558DD (JRC)  
NJM4558DX (JRC)  
NJM2041DD (JRC)  
M-5218P (Mitsubishi)



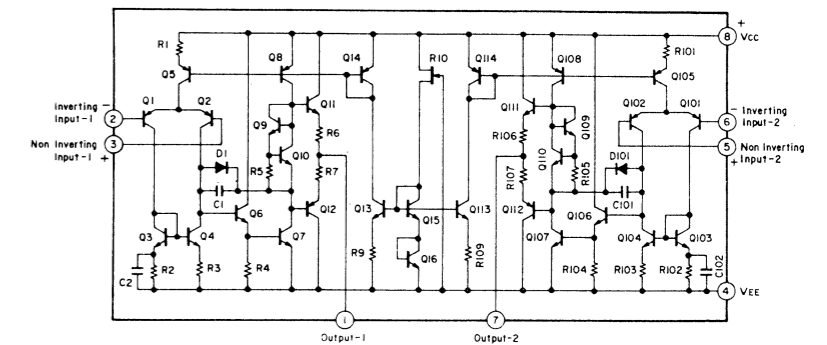
HD14027B  
HA12016  
HA11225  
(Hitachi)



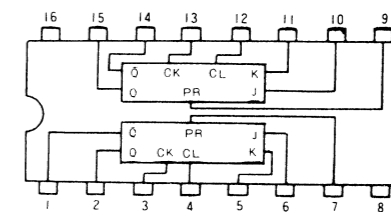
NJM4558DD  
NJM4558DX  
NJM2041DD



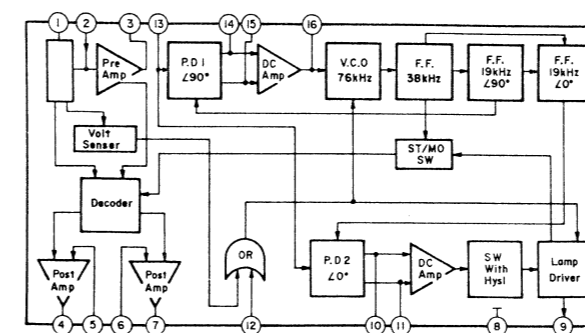
M-5218P



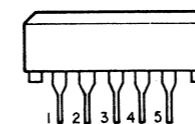
HD14027B



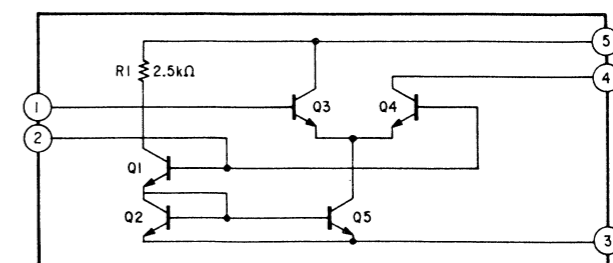
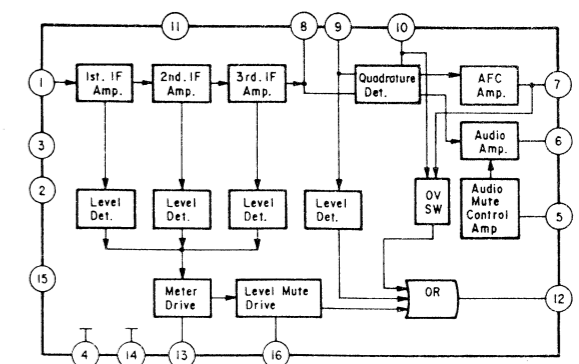
HA12016



TA7060AP (Toshiba)

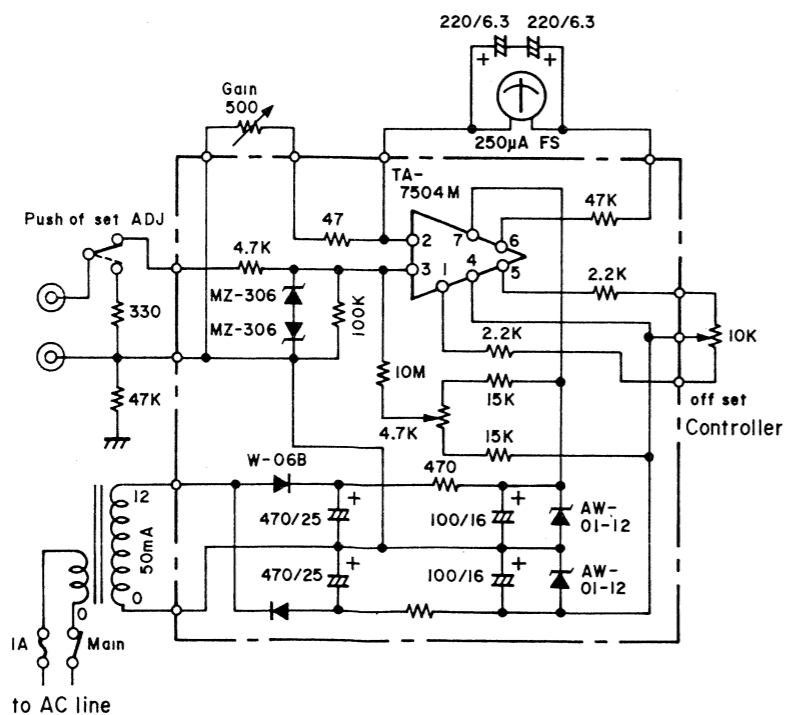


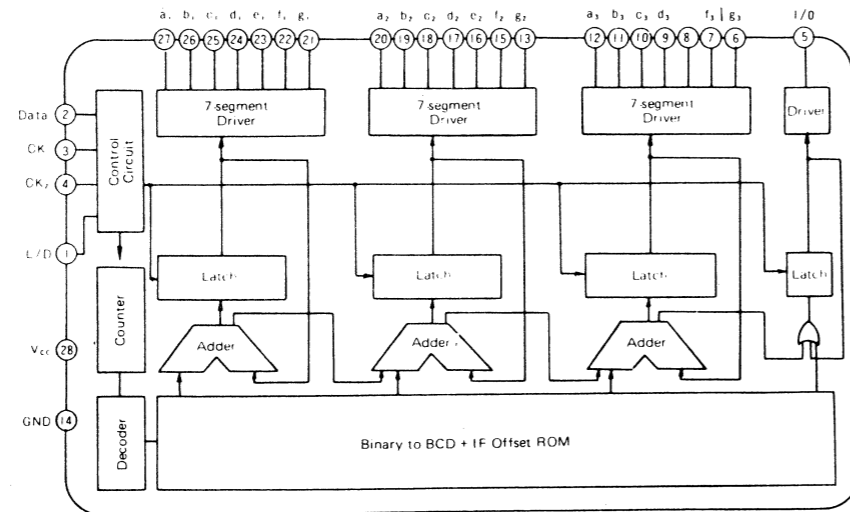
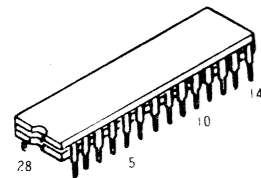
HA11225



**Fig. 13**

## TUNER METER JIG



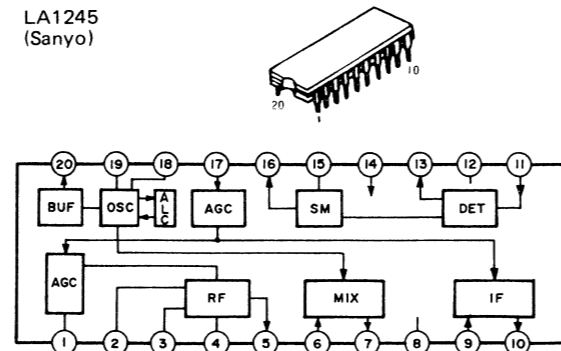
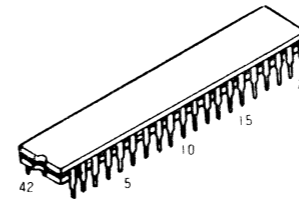
TD6301AP  
(Toshiba)

## FUNCTIONS OF TERMINALS

Pin No.	Name	Function	Pin No.	Name	Function
1	L/D	Output status select input terminal. Input terminal for selecting output status by the indicator (LED, FL, LCD).	6~12	$a^3 \sim g^3$	7-segment drive output terminal. 10 MHz-unit display at FM time. 100 kHz-unit display at AM time.
2	Data	Receiving frequency data input terminal. Input serially by the system controller LSI.	13, 15~20	$a^2 \sim g^2$	7-segment drive output terminal. 1 MHz-unit display at FM time. 10 kHz-unit display at AM time.
3, 4	CK1 CK2	Received frequency data input control timing input terminal. Transferred simultaneously with data by the system controller LSI.	21~27	$a^1 \sim g^1$	7-segment drive output terminal. 100 kHz-unit display at FM time. 1 kHz-unit display at AM time.
5	1/0	Segment drive output terminal. 100 MHz-unit display at FM time. Only 1 pin is used for output because of 1 to 0 in both FM/AM.	14, 28	Vcc GND	Supply voltage applying terminal.

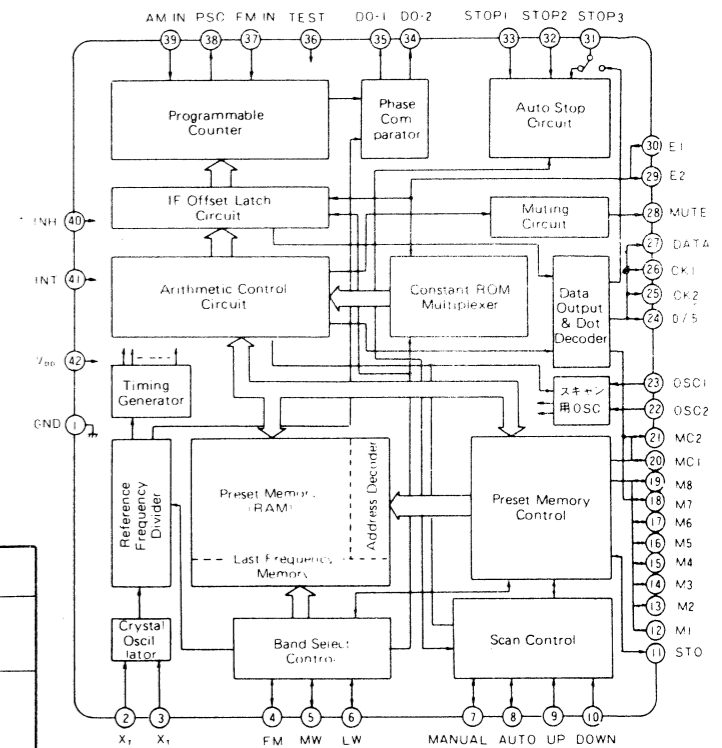
## FUNCTIONS OF TERMINALS

Pin No.	Name	Functions
5	$f_{IN}$	FM station signal input terminal Frequency range 60 — 140 MHz Input level 75 — 300 mVrms
3	OUT-1	Dividing an input signal into 1/30 or 1/32 through dividing output terminal $f_{IN}$ . Output level 0.5(V)MIN
2	OUT-2	OUT-1 inverted signal output. Because of open emitter system, if it is to be used. External resistor is necessary. Open in general.
7	PSC	Dividing value select control terminal 1/32 when $V_{pcc} \geq 2(V)$ , 1/30 when $V_{pcc} \leq 1(V)$
6	C	for bias circuit. Connect C = 2200 pF (approx.) between the unit and the GND.
1 4	Vcc GND	Power terminal Vcc = 5V Icc = 5 mA (standard), 10 mA (max.)

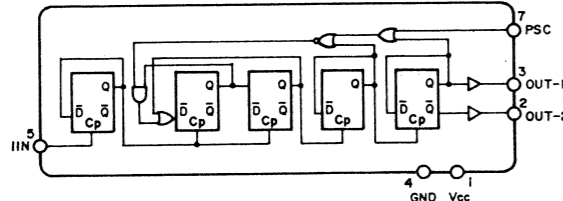
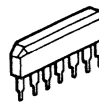
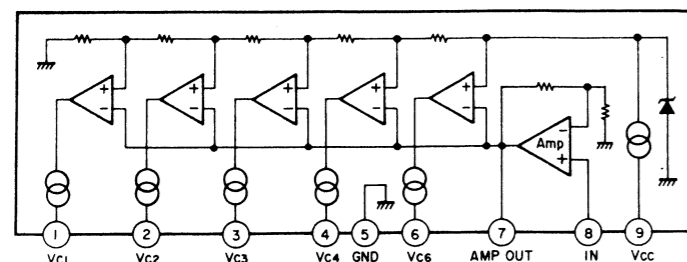
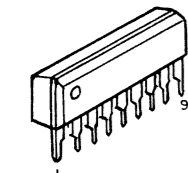
LA1245  
(Sanyo)TC9147BP  
(Toshiba)

## FUNCTIONS OF TERMINALS

Pin No.	Symbol	Name	Function
2	XT	Crystal oscillator terminal	Connects crystal 7.2 MHz for reference frequency.
3	XT	Crystal oscillator terminal	Connects crystal 7.2 MHz for reference frequency.
4	FM	FM band specifying input	Selects FM, MW and LW in the mutual reset mode.
5	MW	MW band specifying input	
6	LW	LW band specifying input	
7	MANUAL	Manual tuning mode specifying input	Selects between manual operation and auto search operation in mutual reset mode at UP/DOWN channel select time.
8	AUTO	Auto search tuning mode specifying input	
9	UP	UP operation key input	UP/DOWN channel selection by connecting a push-key
10	DOWN	DOWN operation key input	
11	STO	Memory store instruction input	With this input, preset memory is set to write enable status.
12~19	M1~M8	Preset memory channel specifying input	Controls read/write of the internal 16-channel preset memory in conjunction with MC1 and MC2 input.
20	MC1	Memory control input	Sets the 16-channel preset memory to an 8-channel fixed system for FM/AM (MW + LW) or a 16-channel tandem system for FM+MW+LW (3 bands).
21	MC2		
22	OSC2	Oscillator terminal for AM	C/R connecting terminal for oscillator, which determines scan speed at AM search time.
23	OSC1	Oscillator terminal for FM	C/R connecting terminal for oscillator, which determines scan speed at FM search time.
24	0/5	FM Europe 50 kHz output	Europe area FM band 50 kHz step indicating output. Set "H" at 50 kHz.
25	CK2	Received frequency data serial output	Outputs serial data and timing lock to driver TD6301 for receiving frequency digital display. CK1 output is used as Pcc output at the same time.
26	CK1		
27	DATE		

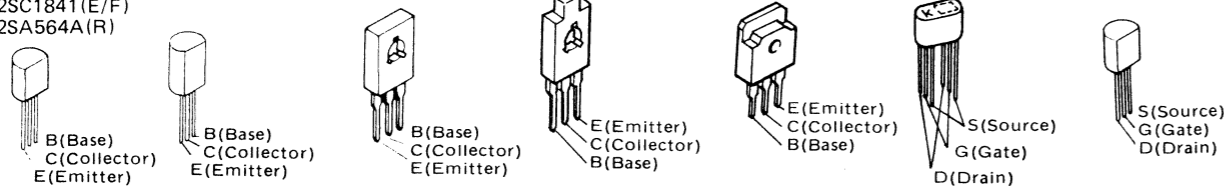


Pin No.	Symbol	Name	Function
28	MUTE	Muting signal output	Set "H" at muting output time.
29	E2	Area specify input	Specifies an area, Japan, U.S.A. or Europe.
30	E1		
31	STOP3	AM-IF signal input	Counts IF 450 kHz signals at AM time and stops auto search.
32	STOP2	Auto search stop signal input	If "H" level is input STOP2 when "H" level is set to STOP1, the auto search is stopped. Used for AR1 or stereo channel receiving status discrimination.
33	STOP1	Scan speed slow input	When "H" level is input, reduces the auto search scan speed to 1/2.
34	DO-2	Phase comparator output	Two tristate buffers are output in parallel from a single phase comparator.
35	DO-1		
36	TEST	Test terminal	Sets test mode with "H" level input.
37	FM <sub>IN</sub>	FM programmable counter input	Connects the output of prescaler TD6104P.
38	PSC	Prescaler control output	Controls dividing (1/30, 1/32) of the prescaler TD6104P.
39	AM <sub>IN</sub>	FM programmable counter input	Inputs AM channel signal.
40	INH	Inhibit input	Ordinary operation at "H" level, and inhibit status at "L" level.
41	INT	Initialize input	Ordinary operation at "H" level, and initialization of internal status at "L" level.
42	VDD GND	Power applying terminal	Applies 5 ± 0.5 V. Up to 2 V is available as backup.

TD6104P  
(Toshiba)LB1403  
(Sanyo)

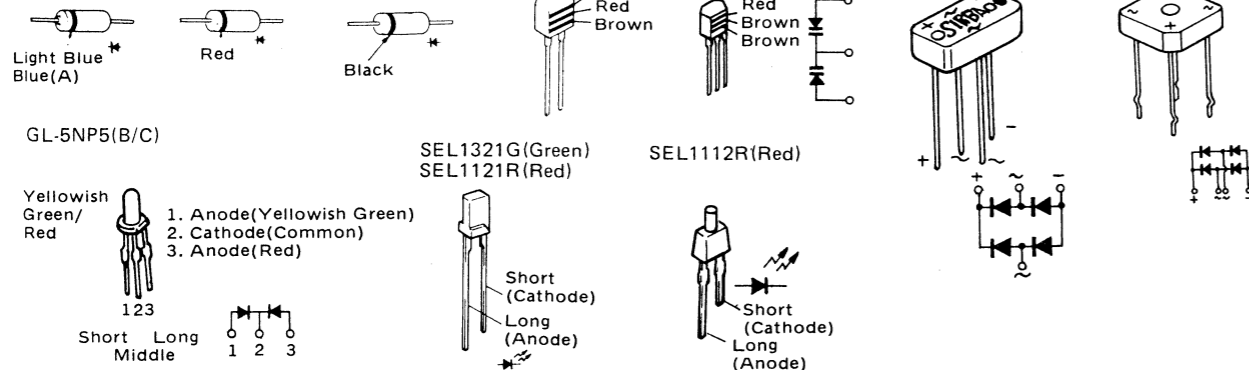
## • TRANSISTORS

2SC1685(R)	2SB647A(C)	2SA1184(Y/O)	2SD1406(Y/GR)	2SA1106(Y/O)	FET	FET
2SA988(E/F)	2SD667A(C)	2SD882(Q/P)		2SC2581(Y/O)	2SK240(BL)/(V)	2SK163M
2SC461(C)		2SC2824(Y/O)				
2SC1815(BL)						
2SC1841(E/F)						
2SA564A(R)						



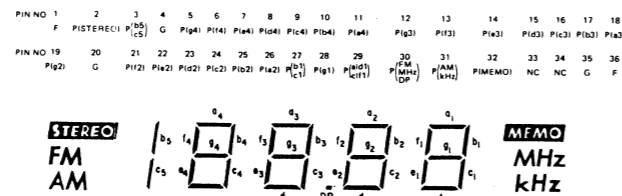
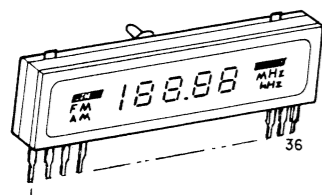
## • DIODES (including LED)

1S2076	1N60	HZ6-B2	HZ16-2	Varactor	Twin Varactor	S1RBA20F	S4VB20F
1S2076A		HZ7C-2	HZ22-2	SVC321SP-D2	SVC211SP-B		
		HZ15-2	HZ9B-2				



## • ELECTRON RAY INDICATOR TUBE

FIP7F8S



## OPERATING PRINCIPLE OF THE SSS (SUPER SEARCHER SYSTEM)

When radio signals of more than two stations on one band enter, a false radio wave will arise at another point. (Assuming two stations.) This false wave causes intermodulation interference. If receiving a station with the same frequency of the false radio wave, reception is accompanied by intermodulation interference noise, and various other interference.

Fig.14 shows how intermodulation interference occurs, and how to make interference-free reception. Two false radio waves, D1 and D2, arise each from one of two radio wave frequencies of stations (A and B). These false waves cause intermodulation interference for reception with station C. If station C's frequency is the same as false frequency D1, it is normally impossible to isolate the false wave. But with the DRA-750, the band eliminate filter, removes false radio wave D1 and D2 from station A or B. Therefore, any audio system employing this Model is assured of quality reception, free from intermodulation interference.

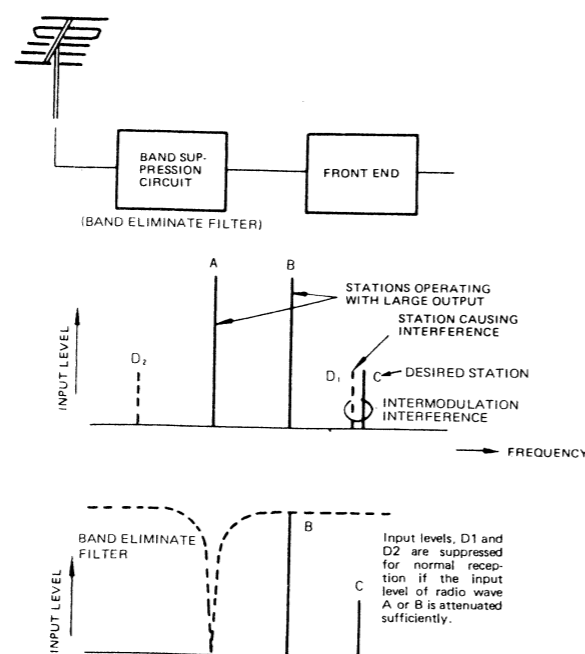
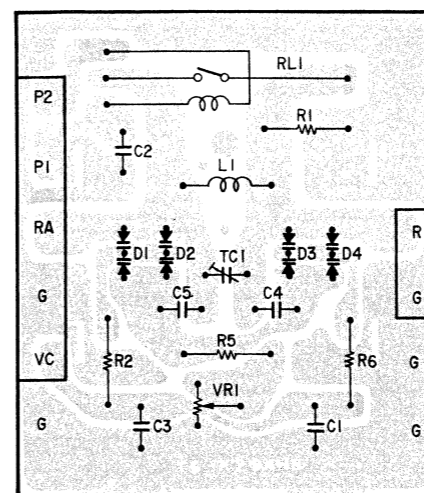


Fig. 14

## PRINTED WIRING BOARD PATTERNS AND PARTS LIST

## ETC0658J TRAP UNIT



## ETC0658J TRAP UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS		
R001, 002	2412148008	220k ohm ±5% 1/4W CARBON
R005	2412089002	750 ohm ±5% 1/4W CARBON
R006	2412148008	220k ohm ±5% 1/4W CARBON
VR001	EP-5462H11	SOLID VR 4.7k ohm
CAPACITORS		
C002, 003	2531024003	0.01μF +80,-20% 50V CERAMIC
C004, 005	2533469006	10pF ±0.5pF 50V CERAMIC
TC001	2130034009	TRIMMER CON. (CTZ-51C)
OTHER PARTS		
RL001	2221003004	P.W. BOARD
L001	4140328004	SHIELD CASE
	2140052000	REED RELAY (L13M)
	RT-11653	FM OSC COIL
	2050087026	2P TERMINAL
	2050087055	5P TERMINAL

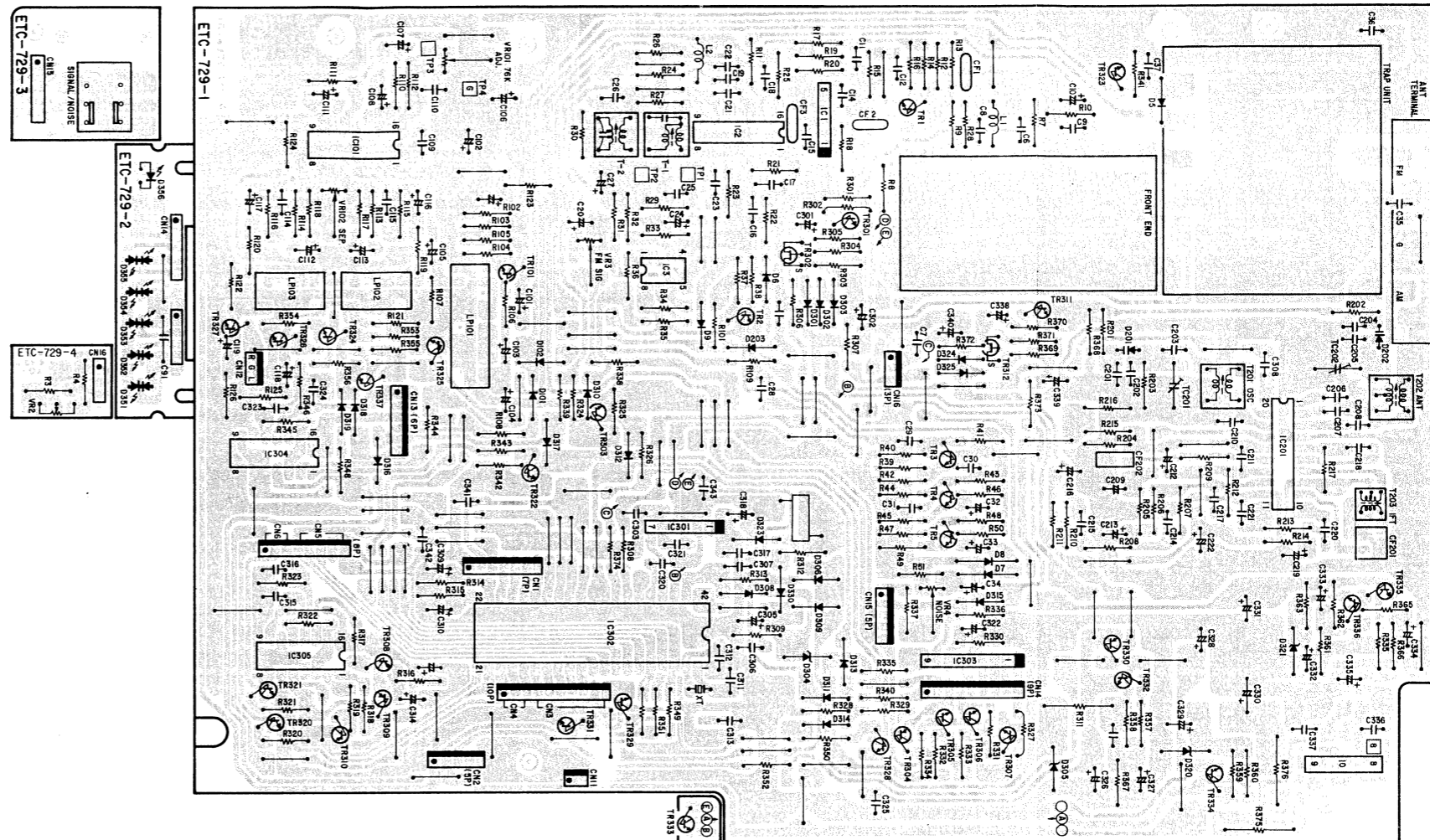
NOTE: If D001, D002, D003 and D004 are to be replaced, be sure to replace them in pairs.

## ETC0729H TUNER UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS		
IC001	2630099007	TA-7060AP IC (TOSHIBA)
IC002	2630083000	HA11225 IC (HITACHI)
IC003	2650030004	NJM4558DD IC (JRC)
IC101	2630123009	HA-12016 IC (HITACHI)
IC201	2630145003	LA1245 IC (SANYO)
IC301	2630232000	TD6104P IC (TOSHIBA)
IC302	2620452104	TC9147BP IC (TOSHIBA)
IC303	2630221008	LB1403 IC (SANYO)
IC304, 305	2620343006	HD14027B IC (HITACHI)
TR001	2730025023	2SC461(C) TRANSISTOR
TR002 ~005	2730294016	2SC1685(R) TRANSISTOR
TR101	2730294016	2SC1685(R) TRANSISTOR
TR301	2730294016	2SC1685(R) TRANSISTOR
TR302	2750020008	2SK163(M) FET
TR303	2730294016	2SC1685(R) TRANSISTOR
TR304	2710178039	2SA564A(R) TRANSISTOR
TR305 ~307	2730294016	2SC1685(R) TRANSISTOR
TR308 ~310	2710178039	2SA564A(R) TRANSISTOR
TR320	2730294016	2SC1685(R) TRANSISTOR
TR328	2710178039	2SA564A(R) TRANSISTOR
TR329	2730294016	2SC1685(R) TRANSISTOR
TR330	2710178039	2SA564A(R) TRANSISTOR
TR331	2730294016	2SC1685(R) TRANSISTOR
TR332	2740078031	2SD882(Q/P) TRANSISTOR
TR333	2740088018	2SD1406(Y)/(GR) TRANSISTOR
TR334 ~336	2730294016	2SC1685(R) TRANSISTOR
TR337	2710178039	2SA564A(R) TRANSISTOR
D005, 006	2760049011	1S2076A DIODE
D007, 008	2760002003	1N60 DIODE
D009	2760049011	1S2076A DIODE
D101, 102	2760049011	1S2076A DIODE
D201, 202	2760302004	SVC321SP-D2 VARACTOR
D203	2760049011	1S2076A DIODE
D301 ~303	2760049011	1S2076A DIODE
D304	2760218033	HZ9B2 ZENER
D305	2760173039	HZ6-B2 ZENER
D306 ~319 (EXCEPT D307)	2760049011	1S2076A DIODE
D320	2760256008	HZ16-2 ZENER
D321	2760051070	HZ7C-2 ZENER
D322	2760239009	S1RBA20F DIODE
D323	2760049011	1S2076A DIODE
D330	2760049011	1S2076A DIODE
D351 ~355	3939237006	GL5NP5(B/C) (RED/GREEN) LED
D356	3939261014	SEL1321G (GREEN) LED
RESISTORS (not included Carbon Film ±5%, 1/4W Type)		
ΔR123	2412321061	47 ohm ±5% 1/4W CARBON (NB)
ΔR311	2440031022	150 ohm ±5% 1W METAL OXIDE FILM (NB)
ΔR334	2412314052	82 ohm ±5% 1/4W CARBON (NB)
ΔR364	2412314023	470 ohm ±5% 1/4W CARBON (NB)

Ref. No.	Part No.	Part Name & Descriptions			
ΔR375, 376	2440005029	1 ohm	±5%	1W	METAL OXIDE FILM (NB)
VR002	2110404002	PUSH LOCK VR 100k ohm			
VR003, 004	2116000073	SEMI FIXED RESISTOR 20k ohm			
VR101	2116000099	SEMI FIXED RESISTOR 2k ohm			
VR102	2116000086	SEMI FIXED RESISTOR 200k ohm			
CAPACITORS (not included Ceramic ±5%, ±10%, 50V Type)					
C006	2551072006	0.01 μF	±10%	50V	PLASTIC FILM
C007 ~009	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C011	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C014 ~017	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C019	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C020	2544145005	0.47 μF		50V	ELECTROLYTIC
C021	2531025002	0.022 μF	+80,-20%	50V	CERAMIC
C022	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C024	2544146004	1 μF		50V	ELECTROLYTIC
C025, 026	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C027	2544136001	100 μF		16V	ELECTROLYTIC
C032, 033	2544145005	0.47 μF		50V	ELECTROLYTIC
C034	2544146004	1 μF		50V	ELECTROLYTIC
C036, 037	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C101	2544148002	3.3 μF		50V	ELECTROLYTIC
C102	2544021006	470 μF		16V	ELECTROLYTIC
C103, 104	2544132005	10 μF		16V	ELECTROLYTIC
C105	2544148002	3.3 μF		50V	ELECTROLYTIC
C106	2544146004	1 μF		50V	ELECTROLYTIC
C107	2544148002	3.3 μF		50V	ELECTROLYTIC
C108	2544146004	1 μF		50V	ELECTROLYTIC
C109	2551122008	0.047 μF	±5%	50V	PLASTIC FILM
C110	2556099000	0.001 μF	±5%	50V	PLASTIC FILM
C111	2544148002	3.3 μF		50V	ELECTROLYTIC
C112, 113	2544133004	22 μF		16V	ELECTROLYTIC
C114, 115	2551120013	0.0012 μF	±5%	50V	PLASTIC FILM
C116, 117	2544148002	3.3 μF		50V	ELECTROLYTIC
C118, 119	2544089006	1 μF	±20%	50V	ELECTROLYTIC
C201	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C202	2533603008	10pF	±0.5pF	50V	CERAMIC
C203	2556089007	390pF	±5%	50V	PLASTIC FILM
C204	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C205	2533600001	7pF	±0.5pF	50V	CERAMIC
C206, 207	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C208	2531026001	0.047 μF	+80,-20%	50V	CERAMIC
C209	2544140000	4.7 μF		35V	ELECTROLYTIC
C210, 211	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C212	2544146004	1 μF		50V	ELECTROLYTIC
C213	2544147003	2.2 μF		50V	ELECTROLYTIC
C214	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C215	2551076002	0.022 μF	±10%	50V	PLASTIC FILM
C216, 217, 218	2544163003	220 μF		16V	ELECTROLYTIC
C219	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C220	2544132005	10 μF		16V	ELECTROLYTIC
C221	2531024003	0.01 μF	+80,-20%	50V	CERAMIC
C222	2544136001	100 μF		16V	ELECTROLYTIC

## ETC0729H TUNER UNIT

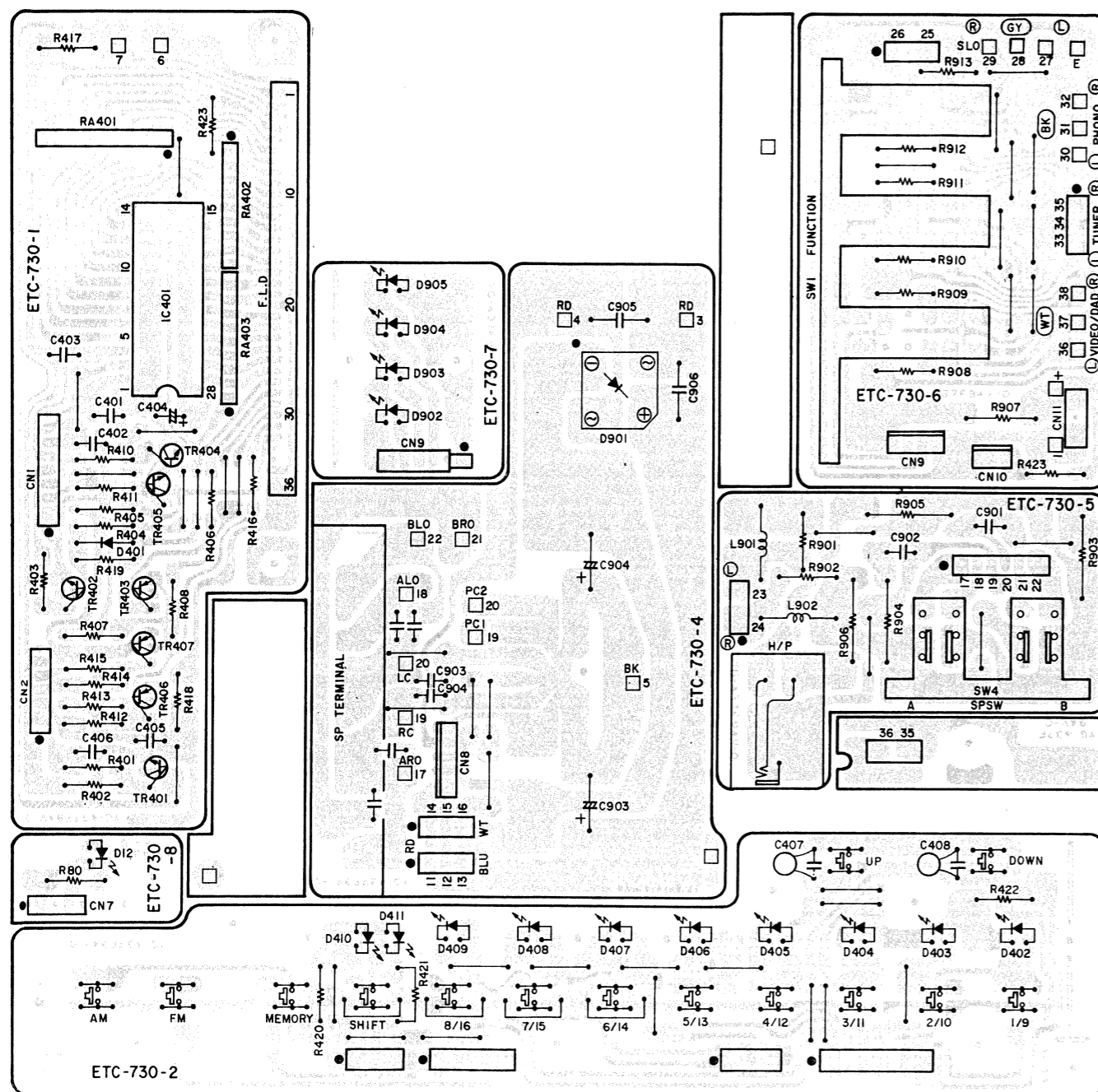


Ref. No.	Part No.	Part Name & Descriptions			
C301	2541029001	1μF	±20%	35V	TANTALUM
C302	2544139008	100μF		25V	ELECTROLYTIC
C303	2551072006	0.01μF	±10%	50V	PLASTIC FILM
C304	—	—	—	—	—
C305	2544161047	470μF		6.3V	ELECTROLYTIC
C306	2531024003	0.01μF	+80,-20%	50V	CERAMIC
C309, 310	2544147003	2.2μF		50V	ELECTROLYTIC
C313	2531024003	0.01μF	+80,-20%	50V	CERAMIC
C314	2544017007	47μF		16V	ELECTROLYTIC
C315, 316	2531025002	0.022μF	+80,-20%	50V	CERAMIC
C317	2531024003	0.01μF	+80,-20%	50V	CERAMIC
C318	2544129005	47μF		10V	ELECTROLYTIC
C320, 321	2531024003	0.01μF	+80,-20%	50V	CERAMIC
C322	2544140000	4.7μF		35V	ELECTROLYTIC
C323, 324	2531025002	0.022μF	+80,-20%	50V	CERAMIC
C325	2531024003	0.01μF	+80,-20%	50V	CERAMIC
C326	2544136001	100μF		16V	ELECTROLYTIC
C329	2544029008	220μF		25V	ELECTROLYTIC
C330	2544086009	2200μF	±20%	25V	ELECTROLYTIC
C331	2544159004	100μF		35V	ELECTROLYTIC
C332	2544132005	10μF		16V	ELECTROLYTIC

Ref. No.	Part No.	Part Name & Descriptions		
C333	2544148002	3.3μF	50V	ELECTROLYTIC
C334, 335	2544059049	22μF	63V	ELECTROLYTIC
C336, 337	2531024003	0.01μF	+80,—20%	50V CERAMIC
C341, 342	2531026001	0.047μF	+80,—20%	50V CERAMIC
TC201, 202	2130022008	TRIMMER CONDENSER		
COILS, TRANS				
T001	2312901002	FM IF DET (A) (50kHz)		
T002	2312902001	FM IF DET (B) (50kHz)		
T201	2311076103	MW OSC COIL		
T202	2311061008	MW ANT TRANS		
T203	2310056001	AM IFT		
LP101	2320069004	ANTI BIRDIE FILTER (114kHz)		
LP102, 103	2320041006	LOW PASS FILTER (19kHz, 38kHz)		
CF001	2610038004	FM C. FILTER (10.7M A8)		
CF002, 003	2610023006	FM C. FILTER (SFE10.7MHz A)		
CF201	2610034008	AM C. FILTER (SEP450H)		
CF202	2610031001	AM C. FILTER (BFU450C4)		
XT	3990008038	X-TAL (7.2MHz)		

Ref. No.	Part No.	Part Name & Descriptions		
L001, 002	2350015043	INDUCTOR (2.2mH)		
	2169002002	FRONT END		
OTHER PARTS				
	2221080108	P.W. BOARD		1
	EP-5667H1	TERMINAL PIN		9
	2090008120	JUMPER WIRE P=10mm		86
	2050190023	2P NH CONNECTOR BASE		1
	2050190036	3P NH CONNECTOR BASE		2
	2050190052	5P NH CONNECTOR BASE		2
	2050190065	6P NH CONNECTOR BASE		1
	2050190078	7P NH CONNECTOR BASE		1
	2050190081	8P NH CONNECTOR BASE		1
	2050190094	9P NH CONNECTOR BASE		1
	2050190007	10P NH CONNECTOR BASE		1
	2050241037	3P CONNECTOR PIN ASS'Y		1
	2050185038	3P WIRE HOLDER		3
	2050185041	4P WIRE HOLDER		1
	2050185054	5P WIRE HOLDER		2
	2030225060	1P CONTACT ASS'Y		1
	2034203062	3P CONNECTOR CORD		1
	2038109010	5P CONNECTOR CORD		1
	2042093002	9P CONNECTOR CORD		1
	2124458002	SLIDE SW (SCL-202)		1
	2050208009	3P NJ ANT TERMINAL		1
	3940005007	LITHIUM BATTERY		1

## ETC0730Q CONTROL UNIT



## ETC0730Q CONTROL UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions
<b>SEMICONDUCTORS</b>		
IC401	2620453006	TD6301AP IC (TOSHIBA)
TR401, 402	2730294016	2SC1685(R) TRANSISTOR
TR403	2710178039	2SA564A(R) TRANSISTOR
TR404, 405	2730294016	2SC1685(R) TRANSISTOR
TR406, 407	2710178039	2SA564A(R) TRANSISTOR

Ref. No.	Part No.	Part Name & Descriptions
D402 ~409	3939261001	SEL1121R(RED) LED
D410, 411	3939260002	SEL1112R(RED) LED
D901	2760338007	S4VB20F DIODE
D902 ~905	3939261014	SEL1321G(GREEN) LED
	3934009019	FIP7F8S DISPLAY

## ETC9028 POWER PRE UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions				
RESISTORS						
R401 ~404	2412130003	39k ohm	±5%	1/4W	CARBON	
R405 ~409	2412116001	10k ohm	±5%	1/4W	CARBON	
R410 ~415	2412130003	39k ohm	±5%	1/4W	CARBON	
R416	2412116001	10k ohm	±5%	1/4W	CARBON	
R417, 418	2412076002	220 ohm	±5%	1/4W	CARBON	
R419	2412130003	39k ohm	±5%	1/4W	CARBON	
R420	2412087004	620 ohm	±5%	1/4W	CARBON	
R421	2412108006	4.7k ohm	±5%	1/4W	CARBON	
R422	2412087004	620 ohm	±5%	1/4W	CARBON	
R423	2412110007	5.6k ohm	±5%	1/4W	CARBON	
R901, 902	2412060005	47 ohm	±5%	1/4W	CARBON	
ΔR903, 904	2440021029	22 ohm	±5%	1W	METAL OXIDE FILM (NB)	
ΔR905, 906	2440033020	220 ohm	±5%	1W	METAL OXIDE FILM (NB)	
RA401 ~403	2462012003	10k ohm x 8	±20%	1/8W	RESISTOR ARRAY	
CAPACITORS						
C401 ~403	2531006005	2200pF	±10%	50V	CERAMIC	
C407	2533633007	180pF	±5%	50V	CERAMIC	
C901, 902	2551121067	0.022μF	±5%	50V	PLASTIC FILM	
C903, 904	2546074006	10,000μF	±20%	63V	ELECTROLYTIC	
C905	2531053003	0.01μF	+100,—0%	500V	CERAMIC	
C951 ~954	2531008003	4700pF	±10%	50V	CERAMIC	
SWITCHES, COILS						
L901, 902	2124407008 2124499003 2359001004	TACT SWITCH (USED 14) 2P PUSH SWITCH (SP A/B) INDUCTOR (1μH)				
OTHER PARTS						
PL001	2221081204	P.W. BOARD				16
	EP-5667H1	TERMINAL PIN L=21				16
	2090008120	JUMPER WIRE P=10mm				31
	2050151004	8P PUSH TERMINAL (SP OUTPUT)				1
	3930064003	PILOT LAMP				1
	1460703108	LED GUIDE				1
	2048100009	HEADPHONE JACK				1
	4770210016	PUSH RIVET				3
	2050185038	3P WIRE HOLDER				5
	2050185041	4P WIRE HOLDER				2
	2050185054	5P WIRE HOLDER				1
	2050185067	6P WIRE HOLDER				1
	2050185070	7P WIRE HOLDER				2
	2050190052	5P NH CONNECTOR BASE				1
	2032154016	2P CONNECTOR CORD				1
	2038109007	5P CONNECTOR CORD				1
	2038109078	5P CONNECTOR CORD				1
	2042052001	7P CONNECTOR CORD				1
	2042096009	8P CONNECTOR CORD				1
	2042090005	10P CONNECTOR CORD				1

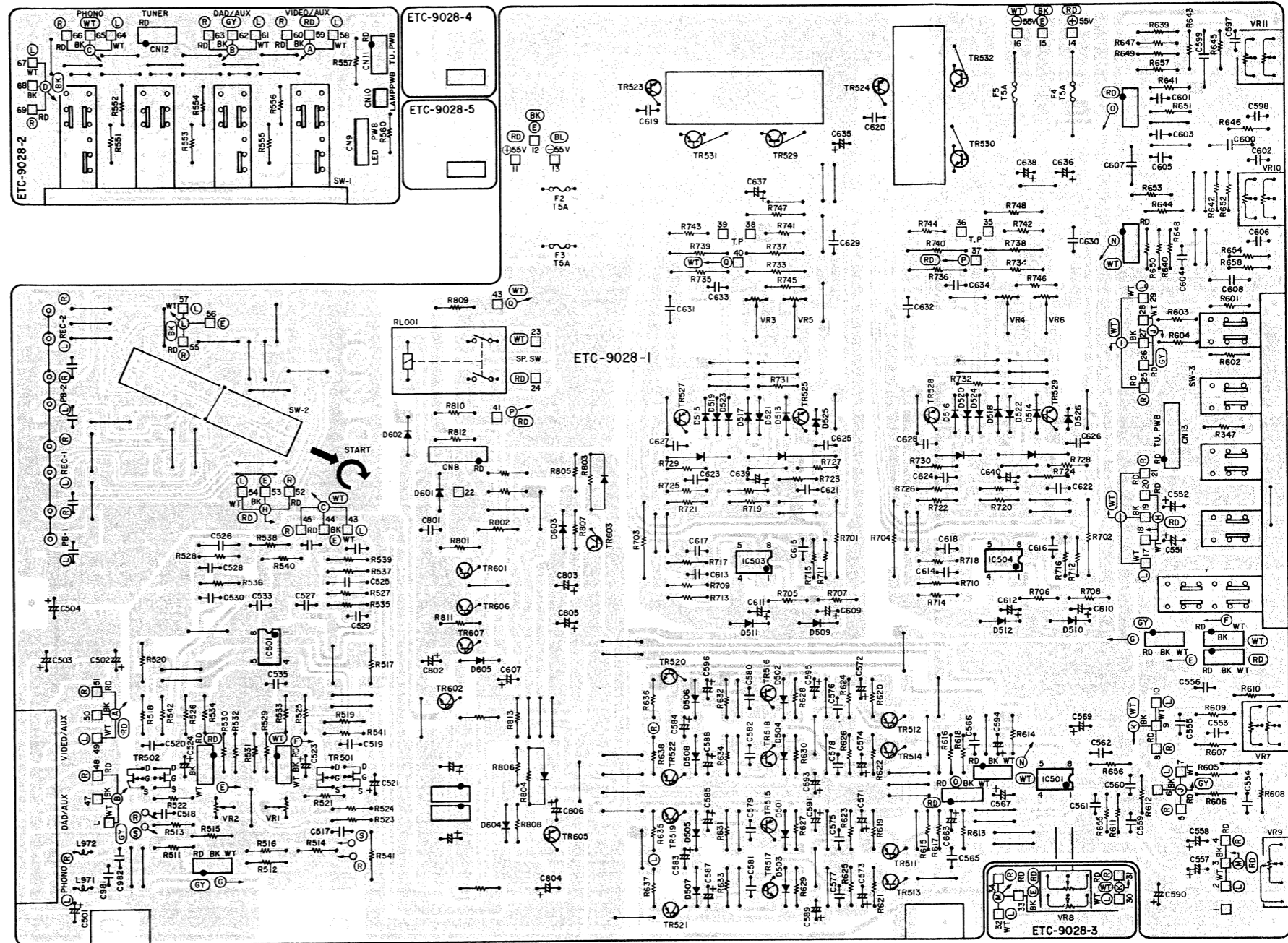
Ref. No.	Part No.	Part Name & Descriptions			
SEMICONDUCTORS					
IC501	2630081015	NJM4558DX		IC (JRC)	
IC502	2630205008	NJM2041DD		IC (JRC)	
IC503, 504	2630257001	M-5218P		IC (MITSUBISHI)	
TR501, 502	2750029025	2SK240(BL)/(FV)		FET	
TR511, 512	2710131021	2SA988(E/F)		TRANSISTOR	
TR513, 514	2730235020	2SC1841(E/F)		TRANSISTOR	
TR515, 516	2710131021	2SA988(E/F)		TRANSISTOR	
TR517 ~520	2730235020	2SC1841(E/F)		TRANSISTOR	
TR521, 522	2710131021	2SA988(E/F)		TRANSISTOR	
TR523, 524	2730198015	2SC1815(BL)		TRANSISTOR	
TR525, 526	2730236029	2SC2824(Y/O)		TRANSISTOR	
TR527, 528	2710135027	2SA1184(Y/O)		TRANSISTOR	
TR529, 530	2730273011	2SC2581(O)/(Y)		TRANSISTOR	
TR531, 532	2710160018	2SA1106(O)/(Y)		TRANSISTOR	
TR601, 602	2730198015	2SC1815(BL)		TRANSISTOR	
TR603	2740060007	2SD667A(C)		TRANSISTOR	
TR605	2720053005	2SB647A(C)		TRANSISTOR	
TR606, 607	2730294016	2SC1685(R)		TRANSISTOR	
D501 ~508	2760049011	1S2076A		DIODE	
D509 ~512	2760253001	HZ15-2		ZENER	
D513 ~524	2760049011	1S2076A		DIODE	
D525, 526	2760049008	1S2076		DIODE	
D601, 602	2760049011	1S2076A		DIODE	
D603, 604	2760301005	HZ22-2		ZENER	
RESISTORS (not included Carbon Film $\pm 5\%$ , 1/4W Type)					
AR068, 069	2412321032	4.7 ohm	$\pm 5\%$	1/4W	CARBON (NB)
R541	2410177000	470 ohm	$\pm 5\%$	1/2W	CARBON
R557	2410181009	680 ohm	$\pm 5\%$	1/2W	CARBON
AR560	2412321016	22 ohm	$\pm 5\%$	1/4W	CARBON (NB)
AR627 ~630	2412314081	560 ohm	$\pm 5\%$	1/4W	CARBON (NB)
AR631 ~634	2412314007	100 ohm	$\pm 5\%$	1/4W	CARBON (NB)
AR635 ~638	2412321061	47 ohm	$\pm 5\%$	1/4W	CARBON (NB)
AR701 ~704	2440103028	2.7k ohm	$\pm 5\%$	2W	METAL OXIDE FILM (NB)
AR705, 706	2412321003	1k ohm	$\pm 5\%$	1/4W	CARBON (NB)
AR709, 710	2412321003	1k ohm	$\pm 5\%$	1/4W	CARBON (NB)
AR723 ~726	2412321003	1k ohm	$\pm 5\%$	1/4W	CARBON (NB)
AR731, 732	2412314081	560 ohm	$\pm 5\%$	1/4W	CARBON (NB)

Ref. No.	Part No.	Part Name & Descriptions				
ΔR733 ~740	2442013093	0.33 ohm	±5%	1W	METAL OXIDE FILM (NB)	
ΔR747, 748	2440021029	22 ohm	±5%	1W	METAL OXIDE FILM (NB)	
ΔR803, 804	2440038025	560 ohm	±5%	1W	METAL OXIDE FILM (NB)	
ΔR812	2412314010	390 ohm	±5%	1/4W	CARBON (NB)	
VR501, 502	EP-5462H1	100 ohm			SOLID VR	
VR503, 504	2116028000	10k ohm			SEMI FIXED RESISTOR	
VR505, 506	2116028013	200 ohm			SEMI FIXED RESISTOR	
VR507	2110433002	100k ohm			VARIABLE RESISTOR	
VR508	2110432100	100k ohm			VARIABLE RESISTOR	
VR509	2110434001	250k ohm			VARIABLE RESISTOR	
VR510	2110435000	50k ohm			VARIABLE RESISTOR	
VR511	2110435013	250k ohm			VARIABLE RESISTOR	

## CAPACITORS (not included Ceramic ±5%, ±10%, 50V Type)

C501 ~504	2544146004	1μF		50V	ELECTROLYTIC	
C521	2544136001	100μF		16V	ELECTROLYTIC	
C523, 524	2549012023	47μF		16V	ELECTROLYTIC	
C525, 526	2551122024	0.068μF	±5%	50V	PLASTIC FILM	
C527, 528	2551120000	0.001μF	±5%	50V	PLASTIC FILM	
C529, 530	2551121054	0.018μF	±5%	50V	PLASTIC FILM	
C533	2531025002	0.022μF		+80,-20% 50V	CERAMIC	
C535	2531025002	0.022μF		+80,-20% 50V	CERAMIC	
C551, 552	2549014018	0.22μF		±20% 50V	ELECTROLYTIC	
C555, 556	2551121067	0.022μF	±5%	50V	PLASTIC FILM	
C557, 558	2544146004	1μF		50V	ELECTROLYTIC	
C563, 564	2544132005	10μF		16V	ELECTROLYTIC	
C565, 566	2533603008	10pF		±0.5pF 50V	CERAMIC	
C567	2544146004	1μF		50V	ELECTROLYTIC	
C569	2544146004	1μF		50V	ELECTROLYTIC	
C571 ~574	2544180028	10μF	±20%	63V	ELECTROLYTIC	
C579 ~582	2534285001	47pF	±5%	500V	CERAMIC	
C583 ~588	2544146004	1μF		50V	ELECTROLYTIC	
C589	2544203002	1μF	±20%	160V	ELECTROLYTIC	
C590	2531024003	0.01μF		+80,-20% 50V	CERAMIC	
C591	2544203002	1μF	±20%	160V	ELECTROLYTIC	
C593	2544203002	1μF	±20%	160V	ELECTROLYTIC	
C595	2544203002	1μF	±20%	160V	ELECTROLYTIC	
C597, 598	2551121041	0.015μF	±5%	50V	PLASTIC FILM	
C599, 600	2551122053	0.12μF	±5%	50V	PLASTIC FILM	
C603, 604	2551121009	0.0068μF	±5%	50V	PLASTIC FILM	
C607, 608	2551122011	0.056μF	±5%	50V	PLASTIC FILM	
C609 ~612	2544151002	22μF		50V	ELECTROLYTIC	
C619, 620	2544132005	10μF		16V	ELECTROLYTIC	
C625, 626	2534285001	47pF	±5%	500V	CERAMIC	
C627, 628	2534283003	39pF	±5%	500V	CERAMIC	

## ETC9028 POWER PRE UNIT

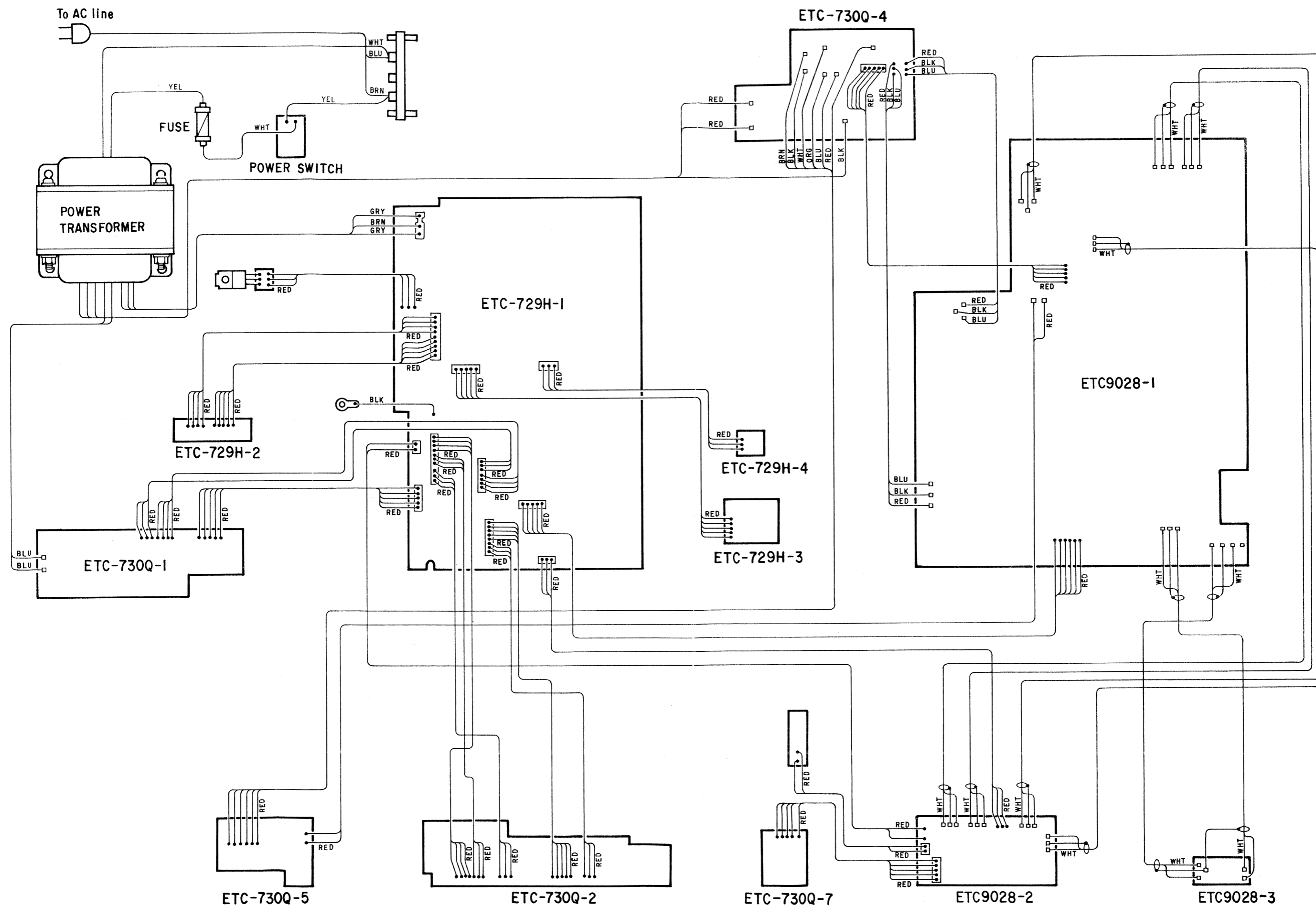


Ref. No.	Part No.	Part Name & Descriptions				
C629 ~632	2551121067	0.022μF	±5%	50V	PLASTIC FILM	
C633, 634	2551121025	0.01μF	±5%	50V	PLASTIC FILM	
C635 ~638	2544203002	1μF	±20%	160V	ELECTROLYTIC	
C639, 640	2544146004	1μF		50V	ELECTROLYTIC	
C801	2544181001	1μF	±20%	100V	ELECTROLYTIC	
C802	2544127007	220μF		6.3V	ELECTROLYTIC	
C803, 804	2544089022	100μF		50V	ELECTROLYTIC	
C805, 806	2544146004	1μF		50V	ELECTROLYTIC	
C807	2544163003	220μF		16V	ELECTROLYTIC	
SWITCH, RELAY, COIL						
RL001	2140037009	RELAY				

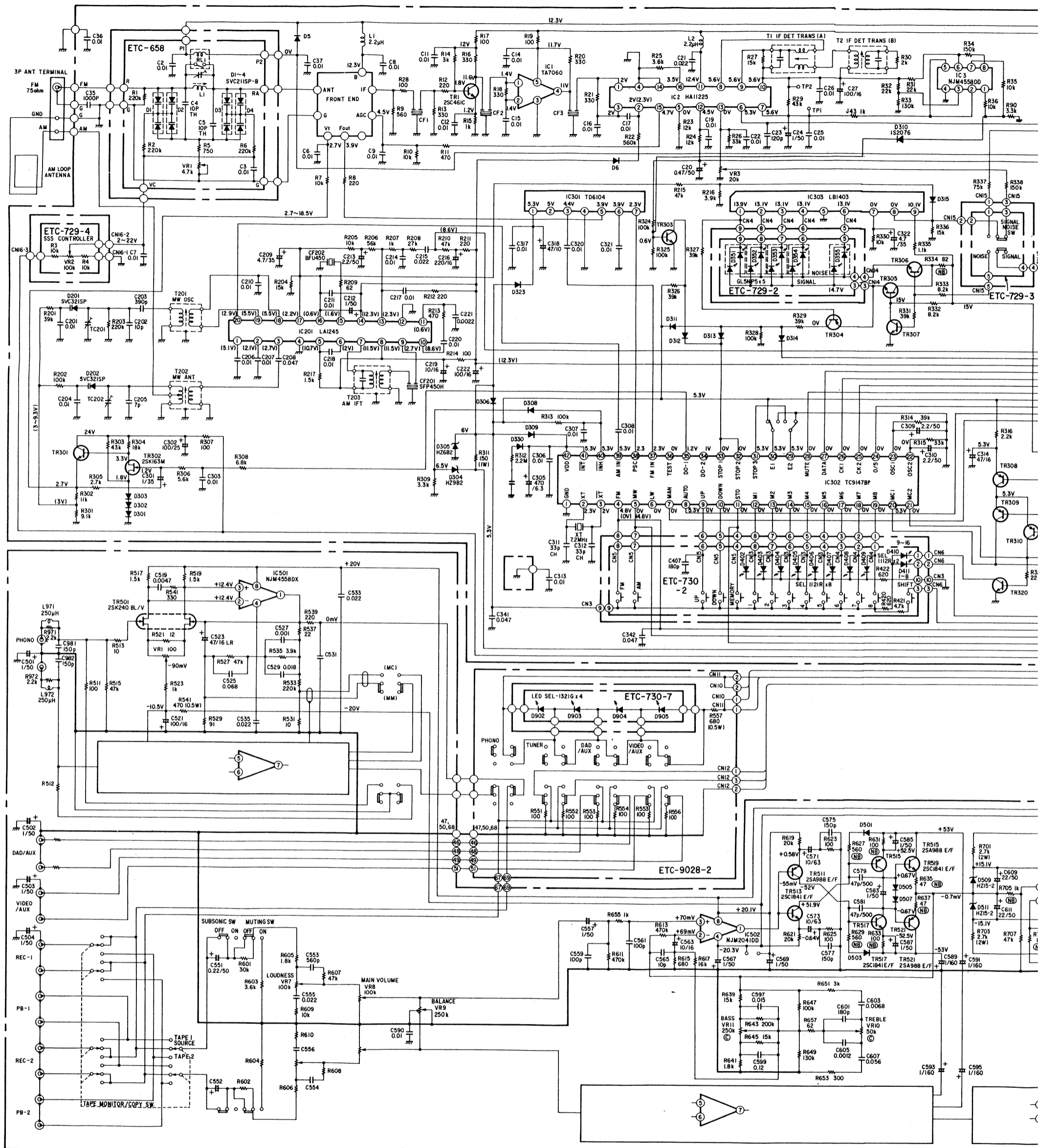
Ref. No.	Part No.	Part Name & Descriptions		
L971, 972	2359003002	FTZ CHOKE COIL		
	2124254002	SLIDE SW (REMOTE)		
	2124503009	INPUT SELECTOR SW.		
	2124500002	5P PUSH SWITCH		
OTHER PARTS				
F502 ~505	2229035003	P.W. BOARD		1
	EP-5667H1	TERMINAL PIN L=21		62
	2090008146	JUMPER WIRE P=5		3
	2090008120	JUMPER WIRE P=10		116
	2020022008	FUSE HOLDER		8
	2061040036	FUSE 5A F		4
	4140240001	EARTH PLATE		2
	4170234003	RADIATOR BLOCK		2
	2050185038	3P WIRE HOLDER		12
	5139119032	FUSE LABEL 5AF		4

Ref. No.	Part No.	Part Name & Descriptions				
	2050185054	5P WIRE HOLDER				
	2050185067	6P WIRE HOLDER				
	2050133022	2P NH CONNECTOR BASE				
	2050133051	5P NH CONNECTOR BASE				
	2050152003	6P CONNECTOR BASE				
	2050150005	4P CONNECTOR BASE				
	2030241057	1P CONTACT ASS'Y				
	2032115000	2P CONNECTOR CORD				
	2034203075	3P CONNECTOR CORD				
	2038123038	5P CONNECTOR CORD				
	2040094029	6P CONNECTOR				
	4700012022	CROSS PAN SCREW WITH S, WASHER 3x12				
	4737002018	TAPPING SCREW (S) 3x8				
	4159001008	F.S. WASHER				

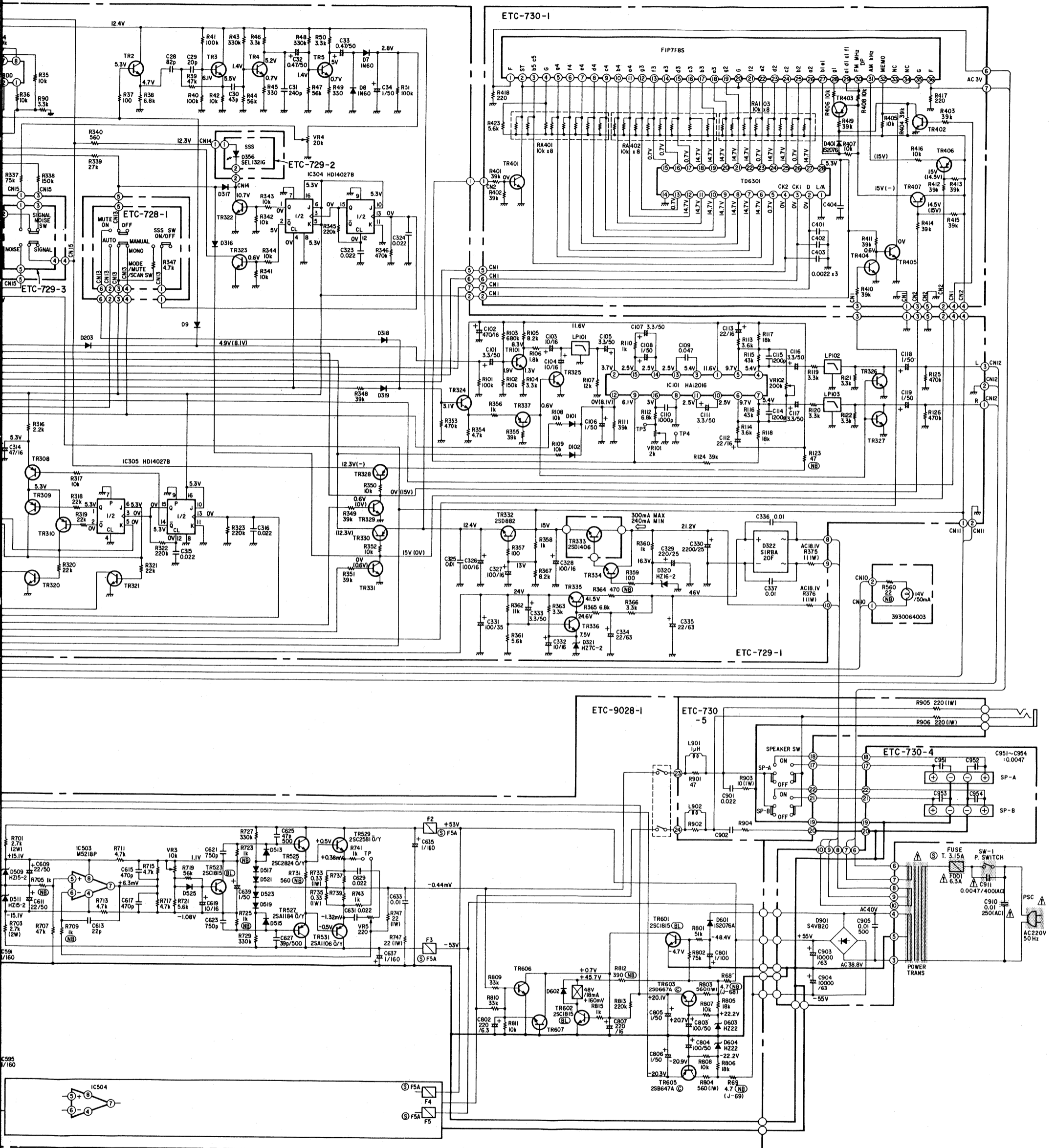
## WIRING DIAGRAM



# SCHEMATIC DIAGRAM



⚠ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



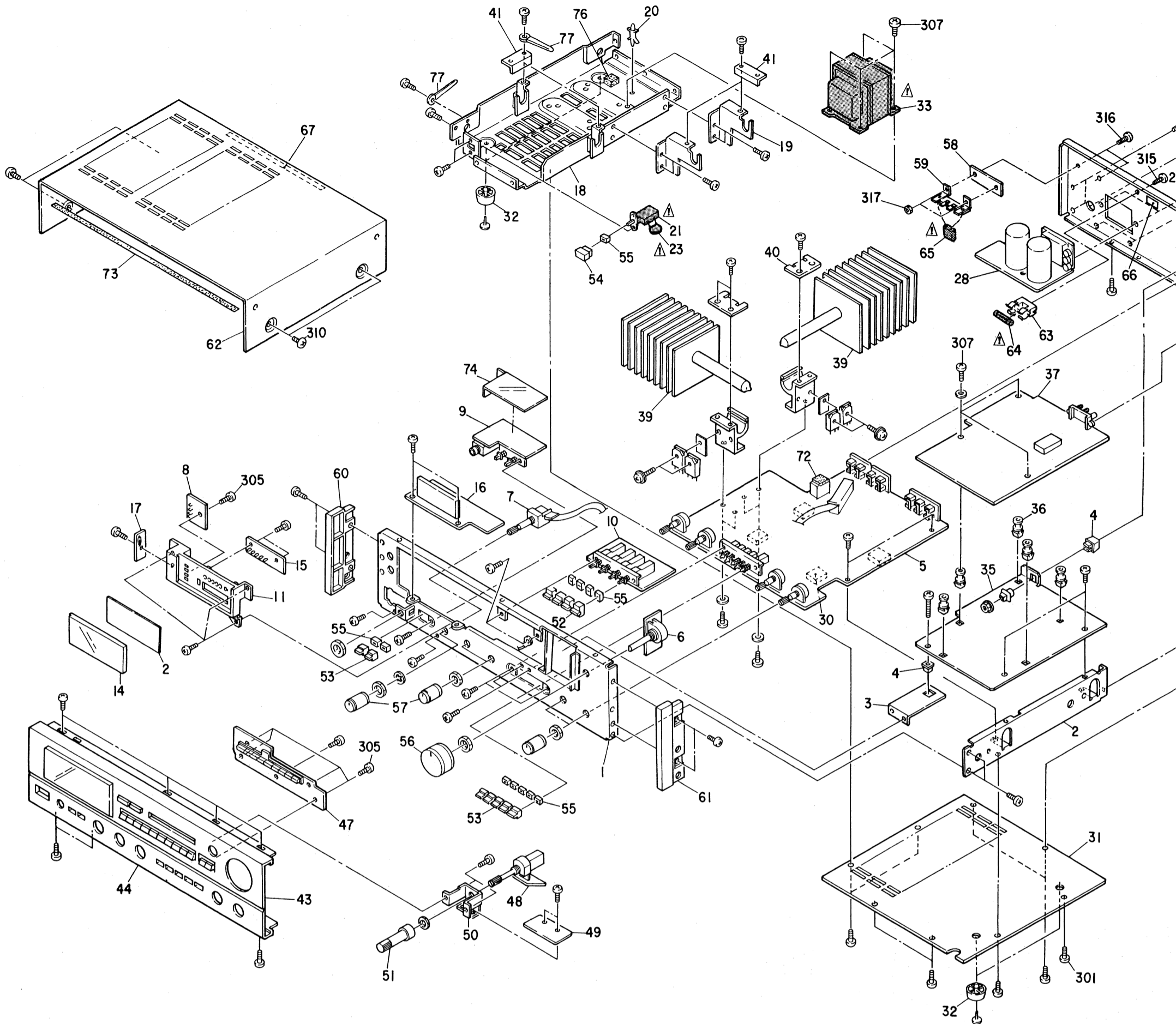
UNLESS OTHERWISE SPECIFIED, ALL SEMICONDUCTOR WITHOUT TYPE NUMBER ARE IS2076A/2SC1685/2SA564A  
VOLTAGE : MEASURED AT FM 87.5MHz NO SIGNAL INPUT  
( ) MEASURED AT AM 522kHz NO SIGNAL INPUT

## NOTES

ALL RESISTANCE VALUES IN OHM K = 1,000 OHM M = 1,000,000 OHM  
ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD  
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.  
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

EXPLODED VIEW OF CHASSIS AND CABINET

⚠ M when necessary by the manu

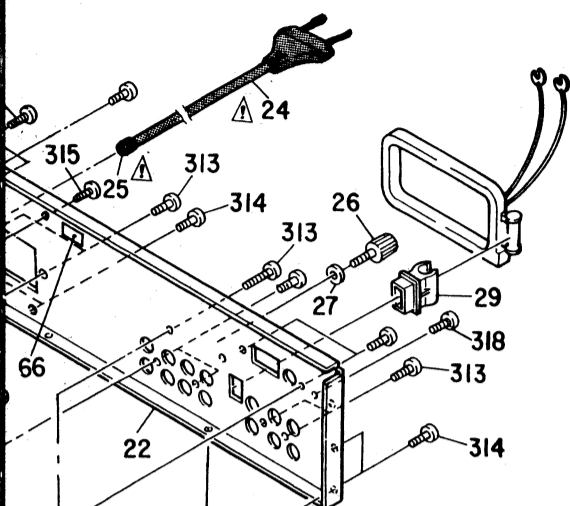


EXPLODED VIEW OF CHASSIS AND CABINET PARTS LIST (Gold Version)

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions	Ref. No.
1	4110430003	FRONT CHASSIS ASS'Y	26	2050071016	TERMINAL ASS'Y	*51	1130503104	KNOB ASS'Y (SSS)	76
2	4110422008	SIDE CHASSIS	27	4770018001	WASHER (P-87)	*52	1130604100	PUSH KNOB FOR FUNCTION	77
3	4121647102	BRACKET (F.C)	28	ETC0730Q5	SP TERMINAL UNIT	*53	1130536029	PUSH KNOB FOR SP. MC. MUT	78
4	4150286000	P.C.B. HOLDER	29	1460494006	ANTENNA HOLDER	*54	1130515134	PUSH KNOB (A) FOR POWER	79
5	ETC9028-1	POWER PRE AMP UNIT	30	4610114023	CUSHION	55	1140056007	FLEXIBLE RING	80
6	ETC9028-3	MAIN VR UNIT	31	1050608008	BOTTOM COVER	*56	1120458104	KNOB ASS'Y FOR MAIN VR	81
7	2124505007	ROTARY REMOTE SW	32	1040111000	FOOT	*57	1120459103	KNOB ASS'Y FOR TONE, TAPE	82
8	ETC0730Q	CONTROL UNIT	33	2339528002	POWER TRANS	58	4150088004	INSULATING SHEET	83
9	ETC0730Q-4	SP SW & H.P UNIT	34	4450033005	WIRE CLAMP BAND 18	59	2050089008	7P W/TERMINAL	
10	ETC9028-2	FUNCTION SW UNIT	35	4140363108	SHIELD PLATE	*60	1460338230	ESC PLATE (L)	
11	1460695203	LED HOLDER	36	4150283003	P.C.B. HOLDER	*61	1460339239	ESC PLATE (R)	
12	1430370105	INDICATION SHEET	37	ETC0729H	TUNER UNIT	*62	1020178115	TOP COVER	
13	-	-	38	ETC0658J	TRAP UNIT	63	2020013101	FUSE HOLDER	
14	1430369006	INSIDE PLATE	39	4170232209	H.P RADIATOR	*64	2061015074	FUSE (3.15A)	
15	ETC0729H-3	SIGNAL UNIT	40	4121646006	RADIATOR BRACKET	*65	2568023006	METALIZED CAP. 0.01μF/250V AC (C-910)	
16	ETC0730Q7	F. LED UNIT	41	4121648004	BRACKET	66	5130654059	FUSE LABEL (T3.15A)	
17	ETC0730Q9	LAMP UNIT	42	ETC0729H-5	TR UNIT	67	1229006017	SPACER (220x5x0.5T)	
18	4110424200	TRANS CHASSIS ASS'Y	*43	1441240208	FRONT PANEL ASS'Y	68	-	-	
19	4121645007	H.P BRACKET (R)	*44	1130601103	PUSH KNOB ASS'Y	69	-	-	
20	4150228000	P.C.B. HOLDER	*45	1430374402	ESC BAR (L)	70	-	-	
*21	2124409008	POWER SWITCH	*46	1430375304	ESC BAR (R)	71	-	-	
22	1059034000	BACK PANEL	47	ETC0730Q2	KEY LED UNIT	72	-	-	
*23	2538003014	CERAMIC CAP 0.0047μF/400V AC (C-911)	48	ETC0729H-3	SSS SW UNIT	73	1229006004	SPACER (420x11x0.5T)	
*24	2062002031	AC CORD WITH PLUG	49	ETC0729H-4	SSS VR UNIT	74	4150287009	ISOLATION SHEET	
*25	4450020005	CORD BUSH	50	4121484103	VOLUME BRACKET	75	-	-	

⚠ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

DENON



**NIPPON COLUMBIA CO., LTD.**

No. 14-14, 4-CHOME AKASAKA,  
MINATO-KU, TOKYO 107 JAPAN  
TEL: 03-584-8111  
TLX: JAPANOLA J22591  
CABLE: NIPPONCOLUMBIA TOKYO

Printed in Japan

Ref. No.	Part No.	Part Name & Descriptions
76	4610114007	CUSHION
77	4450048016	CORD HOLDER
78	1439003004	BLIND SHEET
79	1439003017	BLIND SHEET
80		
81		
82		
83		
PACKING & ACCESSORIES (not included EXPLODED VIEW)		
*a.	5019122000	CARTON CASE
b.	5030448103	CUSHION
c.	5058092049	LAMINATE ENVELOPE
d.	—	—
e.	5050061007	ENVELOPE
f.	5119139003	INST. MANUAL
g.	—	—
h.	—	—
i.	2311060009	LOOP ANTENNA
j.	5290040008	FM ANT ADAPTOR
k.		
l.		

Ref. No.	Part No.	Part Name & Descriptions
SCREWS, NUTS & WASHERS		
301	4737002005	TAPPING SCREW (S) 3x6
302	—	NUT M7 (SP)
303	—	TOOTH WASHER $\phi$ 7
304	—	NUT M12 (SP)
305	4737500015	TAPPING SCREW (P) 3x8
306	—	—
307	4737004003	TAPPING SCREW (S) 4x8
308	—	—
309	—	—
*310	4734801005	TAPPING SCREW (TRUSS) 4x8
311	4751006016	WASHER $\phi$ 5 (BLACK)
312	—	—
313	4737500044	TAPPING SCREW (P) 3x8 (BLACK)
314	4737002034	TAPPING SCREW (S) 3x6 (BLACK)
315	4734453039	TAPPING SCREW 4x6 (BLACK)
316	4700042005	PAN SCREW 3x8 (BLACK)
317	4756006008	NUT M3
318	4770064107	FIXING SCREW

**BLACK VERSION PARTS LIST**  
(Same as GOLD VERSION except the followings)

Ref. No.	Part No.	Part Name & Descriptions
43	1441240211	FRONT PANEL ASS'Y
44	1130601116	PUSH KNOB ASS'Y
45	1430374321	ESC BAR (L)
46	1430375317	ESC BAR (R)
51	1130503117	KNOB ASS'Y (SSS)
52	1130604126	PUSH KNOB FOR FUNCTION
53	1130536045	PUSH KNOB (B) FOR SP, MC, MUT
54	1139030102	PUSH KNOB (A) FOR POWER
56	1120458120	KNOB ASS'Y FOR MAIN VR
57	1120459129	KNOB ASS'Y FOR TONE, TAPE
60	1460338256	ESC PLATE (L)
61	1460339255	ESC PLATE (R)
62	1020178131	TOP COVER
310	4734454038	TAPPING SCREW (TRUSS) 4x8 (BLACK)
a.	5019122000	CARTON CASE